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"VideoID": "1",

"Title": "5 tips for Rough-in Phase on New Construction. Electrical wiring.",

"URL": "https://www.youtube.com/watch?v=dgmwJWLs084",

"Keyword": "Electrical construction techniques",

"Transcript": "guys what's up it's the electrical code coach here and we are out on a brand new barndominium the men have just almost finished wiring it and I just wanted to shoot some action shots and give you some tips for new construction wiring on the rough-in because there's some things that you want to do to set yourself up for the win on the trim out if you're new to the game the rough end is the beginning part of the job before they do drywall the trim out is after the fact and you want your trim out to be as easy as possible on you and there's some things that you can do to make your trim out even easier we're going to walk around here and I'll jump back in randomly at different parts and we're going to look at some tips that you can do to make your trim out awesome that you can do on the rough end let's get to it all right so these are in no particular order I didn't uh wire this one but our boys did a good job and so this one is the perfect place to stop we are in a bathroom now the worst thing that can happen to a bathroom is that the vanity light is not on Center with the sink or not on Center with what other you know amenities it's or what other uh features it's trying to align with whether it be the mirror or some other piece of equipment in the bathroom this has to line up it's super crucial so what we do is we try to find where we think the center of the sink is off the plans or just what it looks like and then we will take that vanity whip so the switches here we'll take the vanity Whip and we'll curl it up and we'll put it in the wall now this one's pretty obvious it's going to be within that stud but often I'll go to the stud before and the stud after and that way I what we do is is you the customer goes ahead they put up the mirror the whole nine yards and the last person to come in is the electrician and they will come in and they'll cut their hole in a perfect spot using a cut in box and be able to reach in and grab that wire and no matter what stud it's in or if they do multiple ones like I'll show you in another bathroom if they do multiple ones you'll be able to reach your wire with ease without having to line the Box up now or count on a drywall or to poke the wire out it never happens just don't do it all right the second thing you can do for yourself on a rough-in is to label the boxes it's super important this looks like a nice neat clean box I didn't make it up it looks clean enough and they've labeled it fan light vanity often in the back it'll be labeled power so definitely label your switches the trim out should be the easiest part of the job it should be a joy for you as an electrician or the homeowner and you definitely want to label these things that you know that way when you set these switches out you know exactly which ones to put all right so here in the kitchen we're dealing with the disposal and the dishwasher now obviously there's no Cabinetry here or anything but we know that we want those receptacles to land underneath the sink so what we will do and usually I take this and roll it out and before I leave here I'll actually roll it out and I'll tell the contractor or the homeowner that wire has to end up in that cabinet don't worry about cutting the Box in perfectly but the wire has to end up in the cabinet if it ends up in the back of the wall let the homeowner the contractor know it's going to cause you all a lot of pain so I just want that wire stubbed out I don't want a cabinet guy cutting my boxes and I want to cut my own boxes in but just have them make sure that they stub that out inside the cabinet same thing here with this this is an above range receptacle Hood we don't know where it's going to go just tell them to pull a tape on it stub it out wherever they want it and then you can deal with it later all right so moving on to the bedroom this is probably the second to greatest tip I'm going to give you today is take pictures once you've roughed it in and you're done take pictures of every single room so boom boom boom just walk around the house taking a bunch of pictures almost every time inevitably a drywaller is going to cover up something and that will give you the proof later now there's lots of tricks of how to find a buried receptacle inside the wall that I can talk to you about later but this is the best one especially the drywaller it's always oh there wasn't a receptacle there well you've got your four foot level out and it's like a seesaw on the wall and then you turn around and you've got a pitcher to prove it there's no excuse at that point so take a picture of the entire house the ceilings the floors the walls and everything in between now here's a good example of a double vanity and or a double vanity light so normally I'd curl up a little bit more wire in that but that's fine but they put some over here where it's likely to be and they've looped up a big curl over there so you would start typically from the switch box say the switch boxes this way from left to right knowing that you could start here find your wire and then you should be able to go over and start there and we just want them to cover that up so we can use cut in boxes later and cut it in another thing that we like to do is put our dryer in our washer at about 48 inches it's so hard to get behind the dryer mine at my house is just dangerous you're grounded the entire time and on tile and on the piece of equipment you have to wiggle your body back there we like to put our dryer in our washer up a little bit higher just to make it easier to use later all right guys and this is the final tip for today I'll try to do another one of these videos with some more tips but this is the number one tip and it's multi-layered on this one you never under any circumstance make up the panel on the rough in for 1 your Breakers could get stolen when I say make up the panel that means terminate all the grounds and neutrals land all your Breakers with the expensive arc fault ground fault breakers then Breakers tend to grow feet and walk off the job so never install those breakers on the front end always install them later never make up a panel on the front end and there's many reasons it can your panel can get ruined it can get they can get broken somebody could spray it I can't tell you how many panels have been sprayed but really the number one reason is is you don't well it's kind of a two part so the first part is you don't want someone to get hurt on the job if you've landed all the breakers you can get a wahoo out here who will hook temporary power to it and try to power stuff up and if you think it's not true some of you guys can drop it down in the comments below you'll get a jake leg electrician out here who's doing a little bit of Plumbing or something and tries to back feed your already made up panel and the second reason that you definitely don't want to do it is you don't want the job to be too complete on the on the rough end on the beginning and the reason is is that if you leave too much money on the table of a job or you make it too easy to do the trim out sometimes people don't call you back and a lot of times you know you've got a good little honey pot at the end of the job you don't want to leave too much money left on the trim out we can make another video about how much to get on the rough end how much to get on the trim out but you definitely don't want it too easy for the customer if the panel is already made up and all I got to do is put in some can light trims there is a chance that they may not call you back at all to finish it and then you would lose out on the second part of that job you've got your name on the permit and if you don't think it happens then you haven't been in the game very long people will will intentionally not call you back on a trim out for that very reason oh man I owe them 3 500 and there's about six hours worth of work here never leave too much money on the table and at the same time always you know set yourself up for safety when it comes to generators and stuff and people back feeding them so you don't want to get involved with that and you don't want you know if there's temporary power on site you don't want somebody coming in here powering up your panel those are just a couple reasons that you do not want to do that all right guys that's it for this video I just wanted to give you a few tips on some things that you can do on the rough-in to make your trim out easier to make your job easier and to make your life easier you don't want to have too many things that have to be fiddled with on the trim out you want it to all be pretty standard and the biggest thing is is whatever you do do it consistently make sure that you're doing it consistently every single time cookie cutter the same way this is how we do bathrooms this is how we do this that way no matter who goes to trim out the job you know you might have one crew roughing in and one crew trim it out and if everybody does everything the same way you will be consistent and it'll be easy on you I am the electrical code coach and my bargain is that these videos will add value to you and you will in turn add value to others let's get to it"

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"VideoID": "2",

"Title": "How To Install Rough In Electricity In A New Construction House - Beginners Guide To Electrical",

"URL": "https://www.youtube.com/watch?v=1D5OqJ5SF\_I",

"Keyword": "Electrical construction techniques",

"Transcript": "this video i'm going to show you how to install rough end electrical in a new construction house and the room i'm standing in right now i'm going to show you a to z on how to do the outlets the light the ceiling fan all that and if you're new to this channel my name is josh it's all about building your house so be sure to subscribe ring that bell so you get a notification or time release new video and hammer that like button for me that's all i ask in return for making this video so we got a lot to do today so let's get started when i go to wire my own house i like to put each bedroom on its own circuit and what i mean by its own circuit is it's going to have a breaker and a home run right to the panel box so that way that one breaker powers that whole bedroom so if you need to shut the power off to that bedroom you just hit that breaker and it kills the power to the lights the receptacles and everything so the first thing i'm going to do is put up the switch box because the switch box is going to be used for the ceiling fan and the light and that's going to be where the power comes in as well so this is a two gang box and what i mean by two gang box there is a place for two switches or two receptacles for that matter if you need to but this is gonna be for switches in this case so i'm gonna show you the height in which to put switches there's really no exact height in which to set a switch box but i always like to go ahead and mark four foot on the stud that's gonna be anchored to and then i either set the whole house and this is up to you you either set it at the top of that four foot mark at the center or place it at the bottom so i like to just go ahead and put that right at the top it gives you a nice precise area to go by and if you notice these notches here or not really notches but these like flanges what this does i'll show you up close is that butts right against the stud and what that does is gives you a half inch so a place for your drywall to um go around so by the time you install the drywall it's going to be flush with this uh double gang box here and in order to anchor it you just drive these nails in all right and that baby is not going anywhere and as far as the placement of this you always place it on the door knob side of the door so if the door swings in like this you want to just reach in and kick the switch on the light up the room which i figured you'd probably assume that but i just want to make that clear all right so now that we have this mounted we know our power is going to be coming into this box okay so we're not going to do that right now but it that means that's going to be what powers our lighting fan so what i'm going to do is get some 12 3 wire and run it up to a ceiling fan mount and i'll show you how to do that i'm going to use this product called the saddle box and it's for ceiling fans or any light fixtures or any hanging light anything like that that's going to have some weight to it and i'll put a link to my amazon store in the description below if you want to check these out if you do purchase it i do get a small commission because i'm an affiliate but there's no extra cost to you to do that but these things are phenomenal and the reason why is the design of them it just saddles right over your rafter or your floor joist if it's a two story if it would go right over it and that's what mounts the ceiling fan to hold that weight so it's a great invention so first thing i do is find the center of the room and mount this into place so if you look here there's a little screw in the center and these two larger screws so you just mount it with these for now and then after the drywall's up and you hang your fan or light then you use these bigger lag bolts so for now we're going to find the center and then we're going to mount it so to do this just take the little screw out of the center and then place it on an impact driver or a drill and i marked the center of the room right here and i just so happen to be sitting on an actual rafter but here's the thing if there's not a center rafter like there is in this instance would you get very lucky if that happens what you what i would had to done is put a block in this space here between the rafters and then that would have been what this saddles onto so if it was in between the rafter it'd go over the block like this but i got really lucky here this never happens by the way but in this case it did so you just put it up where it goes now that we have the saddle box sitting in the center all we got to do is reinstall the little screw through the hole you got it from and we're done so the what holds the weight is those lag bolts once you go to install your actual ceiling fan so that's for another video so be sure to subscribe for that so now i'm going to run 12 3 wire up to this saddle box and to that switch to get that 12 3 wire over to that saddle box i got to drill up through this plate of the wall and since i'm doing a 12-3 wire meaning there's three 12 wires in one wire which i'll show you that in a minute i'm going to use a half inch drill bit and i use a 3 8 drill bit when i'm doing 12 2 wire which there's only two wires in the one wire okay so since i'm doing 12 3 half inch and then i go to the stud in which the box is anchored to for our switches then i drill right up through and make sure you stay in the center of the wall boom right like that now i'm just going to run it right from that switch box over to that saddle box so what i like to do is unravel the wire as it comes out of the spool so that way it's nice and flat by the time it gets to where you need to go because if you pull it straight out of this spool it's going to be all twisted and we don't want that so now as you can see it's nice and flattened out [Music] so now when i get over here to the switch box i just take it wrap it around hold about five inches out of the box then take a pair of wire cutters just cut it off there and this stuff is kind of stout and now what you need to do is go ahead and put it into the switch box and always push the backs of these out a little bit before i run a wire in them okay and now i'm going to slide it into place and i'm not going to staple this yet because i got some more wires coming into this switch box now it's time to start placing the single gang electrical boxes around a room for your outlets before i do that i want to explain to you what the 612 rule is so i want to go to the whiteboard and draw a diagram of it because it's way easier to explain because when it comes to outlet spacing is very important for code let's go over it before i go over the 612 rule on the whiteboard behind me i just want to disclose that i am not an electrician i just learned all this from trial and error from building my own houses throughout time and i had an inspector explain the 612 rule to me a while ago and it stuck with me so i wanted to spread it to all you guys that may find benefit in it and again go with your local building codes don't go off something you see on youtube let's get to it so this diagram is probably the easiest way to understand the 612 rule for outlets so it more or less means 12 foot is the max distance between outlets on a wall and 6 foot means that's how far you need to be from a door there needs to be one outlet at least six foot from the door on each side so as you can see here here's a four foot door in the middle of this 11 foot six wall okay so it's only less than four foot on each one of these walls so if the wall is over two foot it needs to have a receptacle on it so you'd have to put one right here and right here somewhere in between this wall and the door needs to have a receptacle and the same goes that for here so if it's ever two foot you need to have a receptacle on it and another reason for the six foot means from each corner it can't be no more than six foot so as you can see here we're just at the maximum distance from that corner to the six foot and in between we have six foot here and from this corner to this outlet is six foot and as you can see that wall is 18 foot long so that is within code so this is the max distance of 12 foot refers to this wall down here so from the corner of this wall to this first outlet we got five foot so that's within code and then from this outlet to this outlet it's over six foot it's eight foot so we can have up to 12 foot so it can't be longer than 12 foot so we're eight foot so that's within code and we're within five foot from this corner to this outlet so that's good to go so if we look at this 11 foot six wall this wall only needs one right in the center because as you can see here it's five foot nine from the corner to the outlet so that is less than six foot so that meets code so that's good and as you can see this whole room would meet code alright let's get back to physically installing these outlets [Music] [Applause] [Music] [Applause] [Music] [Applause] let me explain to you what i just did there so what i did i measured up off the floor 18 inches where i figured there is going to be a receptacle and then i put an x on the side of the stud so it's easily visible and then i went through and just dropped a receptacle box electrical box whatever you want to call it next to the floor beside where it's going and then i'm just going to go ahead and anchor that right to that mark the top of this outlet box is going to be right there then all you got to do is drop the nails in on the side to anchor it just like did the switchbox and it's going to be spaced out a half inch all right so just like this guys line it up to that mark hold those flanges tight against the stud and then just take a hammer and then drive those nails in now it's time to drill holes all through the studs to connect all the outlets together and what i like to do is i'm a little ocd i like to keep my wires running straight so what i do i pull up from the floor two foot and it's just the easy measurement to remember so i'll go ahead and drill right in the center of that two by four stud or two by six depending on what you constructed with right through that mark but in the center of the stud now i go through and mark the studs as i go and keep on drilling [Applause] [Music] i'm here at the window and obviously we can't continue the 24 inch measurement so i come up around 16 inches on these five foot windows and it seems to be pretty comfortable but i just wanted to point out to you whenever you have a tight space like this a right angle drill of some kind is definitely going to be your best friend this is a job max with the wrangle drill attachment and how it works you just simply slide into the space and drill it out now it's time to start running some wire to each one of those outlets i'm going to be using 12 2 wire and 12 2 is heavier than the 14 too you'll see a lot of people using but i just like to use a little heavier gauge because it can handle a little more load than the 14 2 wire even though it's overkill i just feel better about it so first thing i'm going to do is unspool a bunch of this wire because i gotta be able to go around this whole room and then i'm gonna go ahead and go from this outlet up to the switch first because that's gonna be the power to energize all these receptacles [Music] [Applause] [Music] [Applause] just come up into the switch box first thing and then i want to make sure it's enough to be able to staple this at least four to six inches from this switch and then we're going to come over come down come down loop around the receptacle box now it's the length i'm going to go ahead and cut that right there using a pair of wire cutters and then we're going to push it through into the outlet box now our power going to our receptacles is ran from the switch and now we need to go to the next outlet so i got the end of the wire and i'm going to have to go around the doorway so i'm going to have to drill up into the rafter space and come back down on the other side of the doorway [Music] these are half inch staples that are used for 12 2 wire you'll have to get three quarter inch staples for 12 3 wire that we ran earlier so now what we do pull those wires to about the middle of that stud and you gotta stay within six inches and staple it of that receptacle so that way it will pass code and check your local building codes to see what you need to do but here it's within six inches now every four foot i'm going to place a wire staple to meet the requirements here so this is 12 3 wire right here so we got a red for the fan power and then we got the black for the light power and then we got the neutral which is white then we got the copper which is for ground then this is the 12 2 wire here this one has just one black for the receptacles and that's just the power of those and then you got your bare copper which is where the ground and got the white that's for the neutral i just wanted to show you guys the difference between 12 2 and 12 3. all right as you can see the power that's going to be coming to the switch box runs down here to this receptacle first and it's going to come back up and continue running up over this door opening here and down to this next receptacle so now all we got to do is continue that sequence to each one of these receptacles until we end at this one [Music] [Applause] [Music] all right i want to show you guys a little pro tip when you get to a corner like this where you got to come in and then come out this side so you got to make a 45 degree angle what i like to do is take the wire and go ahead and pre-bend it something like that so you kind of have a hook on it and then just fish it in like that and see if you can get it to hit that hole and that's definitely the easiest way i've found to try to push these wires through all right so there we go and uh i used to not do it that way and it was always a pain until i figured out the arc now we got to tie these wires together and to do that simply go ahead and take the sheathing off the wire itself so all you got to do is take a utility knife and lightly go over the jacket and then just spread back the casing like so reach up in the box go ahead and cut that off any paper that's on there be sure to get that off too and then do that to the other wire and this stuff like i said is very very pliable so it cuts easy and go ahead and separate all those like so and now all we got to do is strip these wires i got a pair of these wire strippers they're really easy to use i'll put a link to my amazon store where you can purchase these anyways you just slide that over that wire you want to leave about half inch go ahead and strip all those and these things work so slick all right now so we want our black and whites over to the side the copper wires are what we're going to be addressing we want to use these copper crimp sleeves and they're also called stay combs but they're really easy to use all you got to do is take the little copper sleeve slide it over both of the grounds like so and then after you do that you want to take a pair of pliers and just smash that crimp ring down like so okay and then go ahead and twist you'll form one solid copper wire you don't have to twist it super tight where you break it but it's nice and snug and then bend one to the side and always cut a little shorter so it didn't so um obvious and then just take that and bend it to the side you'll have this little piece of copper left and then smash it together there this ground is all tied together with a single wire now and then shove all these back in the box and then you'll hook that to the outlet or the receptacle whatever you want to call it whenever the time comes shove them in the box and we will address that after the drywall is hung now all i got to do now is take this 12 2 wire and run it from this switch box over to this panel box in order to get there i just got to run the cable all the way up into the attic space and down to the panel box [Music] this is our power coming from the panel box this is going up the ceiling fan and light combo and then this is the receptacles their continued power so now we're just going to line all those up and go ahead and take a wire staple and then staple those in place and this is a three-quarter inch staple since we got a 12 3 wire we're dealing with i'm going to show you how to tile these wires together in another video so what i do so i know what they are when i go to time together after the drywall's up i go ahead and label them now so i know this one was the power coming from the panel box and this wire here is the continued power but i'm going to put receptacles just to make it simple to remember then the 12 3 wire is a given it's the fan and light combo but i'll go ahead and do that anyways for demonstration purposes and now what we do we're just going to roll those back into the box until the drywall is hung all right one final walkthrough powers to the switch going up to our ceiling fan light combo that's going to be operated off a switch so we're going to have a light here fan here and then the power is going to tie into that switch box and continue to all the receptacles around the room using the 612 rule and everything looks good and we're all stapled off and there is nothing wrong with this job looking very nice before everybody gets in an uproar in the comments about this panel box cover being off and how unsafe it is it's because it's actively being installed i'm actually going to be making a how to install a panel box video and i'll be installing this bedroom we just wired up so be sure to subscribe so you get a notification when i release that video and that's all i got for you today guys and again be sure to ring that bell so you get the notification i'll see you in the next video have a good one"

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"VideoID": "4",

"Title": "Electrical rough-ins are always fun!! #electrician",

"URL": "https://www.youtube.com/watch?v=IZthjsIQ680",

"Keyword": "Electrical construction techniques",

"Transcript": "let's keep building my house so the electricians came in to do the electrical roughing and when they bring their own speaker you know they're going to do a darn good job so they got all these things put in where the light switches are going to be where the outlets are going to be they've ran all the wires even where the vents are and they started setting the electrical panel that turned out really good they got all the wires ran down they started moving in the right direction they got everything pulled to that point of the electrical panel we got that tesla plug-in right there if we ever need it look how beautiful that looks and you know yeah look at my beautiful baby"

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"VideoID": "5",

"Title": "Electrical Construction",

"URL": "https://www.youtube.com/watch?v=daci3qUFvIU",

"Keyword": "Electrical construction techniques",

"Transcript": "hey everybody Levi here with OSU IT I'm the assistant director of prospective students and I'm so glad that you all are joining us today we are here in the electrical construction program to do a live virtual tour and let you all see what really goes on here in the electrical construction program here at OSU IT whether you're joining us live or if you're watching this later on please feel free to ask any questions that you have in the comments we want to get those answered for you and get that information back to you so that you get all of it and you don't miss anything with that being said if you have any friends or family that you think would benefit from watching this please share it with them so that they're able to see it as well and make sure you like and follow the friends of Pete on social media so that you can see more of these videos in the future I'm going to go ahead and turn it over to our awesome electrical construction instructor and let him tell you about the program Keith well I'm heath Moscow I've been teaching here for about five years this is electrical construction it is an associate's degree so usually if I was doing the tour you come in shake hands so I got to be careful with shaking hands right now but anyway they the electrical construction program is it is a degree program so it is not about just being the average electrician it's actually more about working toward a pathway to a leadership position in the electrical field so are our graduates although they still have to go through their apprenticeship and put in time in the field they definitely are going to be prepared for leadership positions after they get through that time in the field whereas somebody that just goes directly into the field they may go into the field and work for four or five years then get their journeyman license and then work several years and get into leadership positions after several years but the pathway that we try to set forth whenever we have our electrical students that are coming through and getting their associate's degree is that they would be on the pathway that they would move into those leadership positions three three or so years after school get their journeyman license and then after a couple more years be able to move into a position where they're in a leadership role in the company that's not going to happen with every student but that's the goal and the pathway that we're trying to promote again because this is an associate's degree is more about the leadership and the knowledge that it takes to be in those leadership positions okay we're going to go through everything in our program from residential to commercial to industrial it is the pathway of residential is not the direction that most of our students are going to go they're mostly going to go into commercial and industrial but we do hit the residential to some extent because foundation there's a lot of foundational information in that job opportunities the electrical field is so huge it's there's so many different directions that they can go they could go into like I said residential commercial industrial construction they could go into industrial electrical maintenance they could get into electrical marketing they could be an engineer's assistant in designing electrical projects also they could get into working in energy management systems working in low voltage electrical fields such as fire alarm and security and things like that okay again the purpose of the course is that they would move toward a leadership role whenever the connect program was originally designed there was a lot of thought of creating a program that would set people on a pathway to own in their own business so that's what the program was originally designed for but there is so many opportunities in larger companies to move up into leadership roles that you could actually make really good money so the instructors that we have they that helps with this a lot of the classes that I teach are going to be the classes that get you through the basics of the electrical field and prepare you for the things that you might do is in the apprentice along with setting a strong foundation for moving forward in the electrical field and then a lot of the classes that are throughout the second year are going to be taught by the construction management by our other electrical instructor that is going to teach a lot of the in-depth calculations and the codes and estimating which is a vital part if you are going to own your own business or if you're going to be in a leadership position that management and estimating is huge [Music] so the the course layout for the program is that we would start out with introduction to electrical trades and electrical theory which is our ACDC class that ac/dc class is huge set setting the foundation again for the basic fundamentals of how electricity works it's impossible to truly understand how the code works to truly understand why we do the things that we do if we don't understand the basic electrical theory of how electricity works in our introduction to Electrical Trades class we go over all the different licensing requirements the basics of tools in the electrical field just get into the real basics of what you're going to be doing as electrician and the mini ladies that you can take as an electrician and then we get into in the second semester we're going to get into motor controls get into electrical wiring methods and and take you take them to the next level somewhat and then in the third semester we get our methods - which is our commercial wiring class and they get the the wiring methods that are used in commercial and then also in that semester they're going to do a construction safety class which will give them their OSHA 30 card which is huge something that's very important out in the field also they're going to take mechanical systems in their third semester which is important for leadership roles in the electrical field that they I understand what's being done around them as an electrician there's so much more than just what the electrician is doing we want to be able to understand the whole construction project to some extent if we only know what we're doing and don't have any idea of what everybody's doing around us then it's going to be hard for us to be in leadership roles because as leaders in companies you're gonna have to work with every other field and and be able to coordinate with every other field so that's something that's huge that's we have our construction management instructors like I said that also teach several of the classes in the program so that brings in that extra element of knowledge and then we also have at times some of our AC our refrigeration instructors will teach some of our some of our classes as well so we're getting a variety of knowledge that's available to the students more knowledge than any one man no matter how much experience or how much time he's had there is as so much available knowledge whenever we're working with several experts in different areas then we get in then after we get through both those classes along with some Jeanette's because it it is an associate's degree and we are trying to promote the well-rounded individual we at OSU IT we have core outcomes for every student and then we also have core out outcomes for the specific programs so we're wanting our students to just be completely well-rounded and ready for leadership roles right around the whole spectrum so we also in the first year we're going to get into blueprints Construction blueprints in general so again we want our students to have a knowledge of the whole job not just not just the electrical part of it but in all of our classes we're going to incorporate some electrical plans so they're going to get electrical plans throughout and then they're also going to get that blueprints class that's for construction in general so once they've finished that first year then they're going to go on an internship but that internship is paid there's multiple companies throughout Oklahoma and through several parts of Texas that are students that our students go to they generally make anywhere from about 13 to some actually around 20 to an hour on their internships so grape a while you're basically in school so that's that's pretty awesome aspect another important aspect of the internship is that it is it's giving the students an idea of what they're getting into and then when they come back from that internship they have so much more insight so many more questions so we can get into things that we weren't able to promote before because they had no idea what was talking about but that paid internship is really awesome for the experience and then as they come back in that second year we start getting a little more into more advanced controls such as PLC's we're also going to get into the industrial wiring methods so that gets gets pretty pretty advanced in to some extent but then in as I get into the fifth semester they get into the cut in the National Electrical Code and into the calculations class so in running an electrical company or being a estimator project manager for a company it's going to be very important that you have a real in-depth understanding of the National Electrical Code it's huge as for any electrician to have a basic knowledge of the National Electrical Code and a basic knowledge of the electrical calculations just so you can pass your journeyman exam but we all want our students to be so far beyond just what it takes for them to pass the journeyman exam we want to in-depth understanding of the National Electrical Code and then in the final semester they're gonna go on another internship and then they're going to take the capstone class which is going to incorporate everything that they've learned so far and then also it's going to get into estimating electrical projects which is again a huge part of the leadership companies so then now we are moving toward getting a lot of our second year classes what can be online as is moving to online and with some virtual meetings so that the students in those last couple of semesters besides their internship are able to continue to work in the electrical field continuing to get the electrical experience while continuing to make money so that prepares them even so much more for the electrical field once they graduate okay so that's kind of a little bit of a rundown on our courses several several courses that I I haven't mentioned but it is if it is set up with the courses designed toward running an electrical company or or being in a leadership role and electrical company so job placement rate for our students is is huge this this semester even with everything that was going on we've still been able to get get placement for our internships and generally most years whenever we don't have something going on like we have right now it's there's way more internship opportunities than there is students same way at graduation there's a way more opportunities than we have students to fill and pay tends to be pretty good the average electrician in nationwide is is somewhere around 50,000 our graduates right out of school on average with their overtime are making close to right around that number and some even well beyond that number [Music] whereas generally electricians are not going to make that number till they get their license but then once they get their license and then they're able to move up and make well beyond that no limits to what why the electrician can make as far as if they're running a business it's all about how how well they how well they run the business being in leadership roles it's not uncommon to be in a leadership role in a large electrical company and make six figures so those are the type of positions that we're promoting our students to move into so let's take a little walk through our our lab here so starting out with some in our wiring methods classes in our introduction classes we're going to get into understanding different devices and how they work together so completing branch circuits we're going to put in all different devices in these boxes we've got by using different different plates different mud rings or RS covers we can do so many different configurations and then the students can get their circuit from a source from the circuit breaker and then go through and complete a circuit just in multiple multiple ways but also we've incorporated some contactors and so they're gonna get also some contactors time clocks with that as well so 3-way 4-way circuits that are controlled by photo eye circuits that are control several several circuits being used through a contactor so we use the different rings where they can have lights for individual devices or multiple devices so we can get several devices all through through the work on these trainers here so then as they get through some of the basics on these boards in our methods classes we're going to [Music] learn more about the three-phase panels and how they work different controls different types of disconnects [Music] protecting our our equipment through cts through fuses and circuit breakers but then we also have pedestals for rvs basic troubleshooting knowledge [Music] in on the wiring methods classes we go over how to use multiple tools again this is things that they'll learn in their meth is one two and three classes learn how to use a wire tagger to pull the wire through conduit they're going to learn how to then PVC pipe using a PVC heater and then we also are going to do a lot of bending with this guy right here a lot of half-inch EMT is something that that we can burn through a lot of and the students can get a lot of a basic technique for bending conduit so they do a lot of that different types of benders we also got a hydraulic bender that we'll use for larger conduits and our threading machine for threading the conduit but the majority of our bending is going to be done with the hand bender because once they learn how the bends work then they should be able to bend on just about anything depending on the different type of machine is just the basics of how that machine works not not the fundamentals of bending we also [Music] have this for portable fish tape where they can suck a string through a conduit there another way of pulling wire is using the fish tote this equipment here is it's great we also will use a vacuum cleaner to suck string because that's the way a lot of times it happens out in the field punching holes in boxes there's many ways that that can be done and there's times whenever a house all will work but most of the time you want a clean hole so you're going to use a punch to connect your pipes to your boxes we'll show them how this works so let's gonna use that and then show them how much more efficient it is to spend a little bit more money and use a hydraulic or battery-operated hole punch of course we use various hand tools in here and then we use our various power tools which is huge so we get into all of that all of those different types of equipment in our methods 1 2 & 3 class also in our wiring methods classes where we've got another building that has our stud frames and our steel structures that we wire up that simulates wiring office buildings or simulating wiring rooms for residential and then we also back behind that building have about a thousand square foot house that we wire up in our residential class and then we tear it out and wire it up again so we wind up with a lot of scrap wire also switch gear that we are going that we observe in our wiring methods 3 class we're not going to get too much in hands into those but we're going to do a lot more seeing what they what what they're made up of course we've got multiple tools that I don't have [Music] which is again is just like in our methods classes we have the training boards that they can do multiple different configurations on the motor control trainers they're able to get multiple different configurations using different types of timers relays push buttons switch hands on switches lights forwards reverse all kinds of different configurations that they can use on these trainers for motor voter starters okay and then they just connect them through these motors so they actually get to see whether the motors going forward or going reverse and see whether the lights that they want on when the motors running are on whether the timer is working correctly all of those different configurations that we can do with these motor controllers then again once they get through the basic understanding of motor controls which is the physical controls of motors then in that fourth semester they get into their PLC's where they've got similar controls but the controls are going to be controlled by a programmable logic controller so we're gonna they're going to get some good foundational knowledge in PLC's from the construction point of view we want to learn how to install them and we want to be able to troubleshoot them we do a little bit of Basic programming but as far as you know designing programs that's not really our specific area then of course over here we have more motor controller simulation type equipment and multiple motors throughout and our storage areas that we look at nameplates then look at different sizes and then we'd get in depth into the code of what we would need to install those types of motors in our wiring methods classes we also are going to use all kinds of testing equipment in the first year we're going to get a good understanding of how to use a our basic multimeter to measure different units of electricity and then as we progress we're going to be able to in the methods to and method straight classes use testing equipment that's a little more specific tracing circuits testing the the insulation of conductors testing what the what the circuit is what the function of circuit is whether it's functioning properly through a circuit analyzer we can test the heat breakers and the wires and different equipment and also test for how efficient the ground is then we also got controls testers for our low voltage equipment as well then of course in everything that we do [Music] safety is huge so we talk about safety from beginning to end now is there any questions yes we do have a few questions there's actually been a lot of questions but Val has been in there answering a lot of those questions so Val we appreciate you getting some of those answers out there whether we've had that hasn't been answered yet is are there opportunities for women in this program and in this field yes there's lots of opportunities for women we've had several women take courses through the program not as many as we would like of course but there has been some and they tend to do pretty well we've had a few recently that that started the program and that hadn't finished but they already they took some courses and they went directly out into the field and are actually doing pretty well in the field excellent do you have anything that you kind of like to say as a final statement to any prospective students or their families haven't thought about that one oh well this is a great program it is a lot of work it's not something that it is college level classes preparing you for again leadership positions so there is a lot of information that we're going to try to get into your mind so it will prepare you for the future not just prepare you to be an average electrician but to prepare you to be on a pathway to be outstanding electrician awesome well thank you all so much for joining us today he thank you for a wonderful tour of the program again if you have any questions even after we wrap this up please go back and put those in the comments because we want to get those answers for you again Val thanks for jumping in there and answering those for us as we win if you have any questions let us know otherwise make sure you follow the Friends of Pete on Facebook and Instagram to keep up with these live tours as they go stay safe stay true to you and go Poe"

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"VideoID": "6",

"Title": "NEW BUILD TIPS: WHAT I WISH I KNEW BEFORE OUR ELECTRICAL APPOINTMENT | Watch This Before You Go!",

"URL": "https://www.youtube.com/watch?v=lgT3vJ-e-IY",

"Keyword": "Electrical construction techniques",

"Transcript": "hi everyone welcome or welcome back to my channel my name is nicole and today i want to go over one of the appointments that maybe you haven't put a lot of thought into i know i certainly didn't we get really caught up with you know the design center and wanting all of that excitement about what the home is going to look like and we tend to forget about one of the important pieces which is your electrical design day now typically this will happen on the same day as your design center appointment usually it's about right beforehand so you'll go there first but again we get really excited about that design center maybe overlook a couple of things that we really do want to think about if you're building a home or if this is something you're interested in go ahead give this video a like subscribe let's get going now this appointment will generally be in two different parts you'll have your low voltage and your high voltage they're done separately because they are different companies entirely but you'll also get two different sheets with your entire home layout and the positioning of whatever it is you're going over now one of these is going to be your typical light switches outlets pre-wires all of that while the other will be a little bit more about you know your home security system any type of media or sound system inputs tv internet all of that so this will be broken up into three parts one of those is going to be before you go one is what to consider at your appointment and the third one is kind of just general advice things that you probably think about that maybe are overlooked so that first piece before you go really think about each and every room individually how it's going to be laid out and kind of what the room function is so i feel like over the course of a couple of these videos we've talked a lot about learning the function of the room you really need to think that through before we go into the lighting sources so you definitely don't want to underlight an area you can over light it's a little bit i say trickier but it's something that can definitely be overdone and you want to think about where you do want that lighting what kind of natural lighting is going to be in that room kind of which direction does that room face and again the kind of activity is this something that you need well lit like your kitchen or are you going to be working in a garage space that needs to be well lit these are the kind of things you want to think about before going into adding or maybe taking out any of those light sources while you're thinking about those rooms also look at about what you think the layout's going to be where is your furniture going to go where do you need those outlets where do you want your light switches if that's something you want to kind of think through and switch around is there anywhere that needs to be hidden or more visible for those outlets these are the kind of things again you don't have to have everything laid out in great detail but if you know about where you know your night stands are going to go where your couch is going to go these things will help if you you know want a floor lamp later you want to make sure that you have access to what you need last thing to do is really go to your model if you can and walk around take note of where the lights are take note of where the light switch is where the outlets all of that and again visualize where you think things will go look at how they have it set up see if it makes sense to you just go through see what you would change what you wish they would have done instead that way you'll have a lot more information going into your appointment about where things are generally located and how you want to move those around so when you finally do sit down for that appointment there are a couple of things that you do want to consider they'll lay out the list in front of you with all the prices for everything they'll go through again your floor plan and they have little stickers they can put to make sure that we agree on the location of everything but these are the things that again might be a little more overlooked maybe something you don't think about right away and we really want to get these locked in as soon as possible you can always switch them later but then you're cutting into walls you have to know you know where your wirings are to begin with it gets a lot more expensive later on so these are some things that you can think about right away it's going to just be a little bit more helpful for you nowadays homes typically don't have any lack of outlets but you really want to think about the placement of them and where you might want some extras do you want them inside any drawers so some kind of hidden compartments do you want them in your pantry are you doing you know all of your small appliances out of sight of the kitchen do you have any other type of under drawer space that you might need an outlet these kind of hidden ways that can help clear off your countertops keep things a little bit more hidden but also keep things very convenient for you are you thinking about putting in a bidet so a lot of these bidet attachments can be just you know with the cold water but they have these really fancy ones with water temperature control with you know air vents and all of that maybe you want an outlet right by your toilet seat so things like that to keep in mind do you want to hide some of those outlets in your kitchen you know beneath the cabinetry are you a gardener do you work a lot outside with tools and you might need a lot more access to your outdoor outlets do you have a cordless vacuum maybe you want to make sure there's an outlet inside a closet somewhere so you can hang that up kind of out of the way again just think through all of these smaller items that are just in your day-to-day life that maybe aren't going to come equipped necessarily right off the bat now your home will come equipped with some pot lights some canned lights whatever you want to call them and they are going to be helpful for just making sure you do have some general light in your space you can always add more you can take them away as well but again think through the lighting remember you don't just want your overhead lighting you do want to hopefully add sconces floor lamps table lamps accent lighting task lighting all of that so you do have a couple other things to keep in mind but again maybe you do want to add some just be careful not to go overboard sometimes a ceiling can look a little bit more like swiss cheese which is not exactly that elevated and classy look we're going for here speaking of those other light sources do you want to hang a chandelier or a pendant light or a couple of pendant lights things over your kitchen island your dining room table your family room all of these probably aren't going to come standard so you do want to make sure that you plot out what kind of lighting fixtures you are looking for now maybe that's also wall sconces if you don't want a table lamp on your nightstands maybe you do love wall sconces this is something i definitely wish i had thought about a little bit earlier and you want to make sure that those can be wired if you can obviously they do make some that you can plug in but then again you have to make sure the outlets are appropriately placed as well there so just again things to think about and think through before you go if you're big into art or you're thinking about going in that direction things like picture lights some of them are hardwired or again some of them you do need an outlet they actually have some really cool battery powered ones as well so there are definitely a lot of options and i think that especially for things like picture lights or under cabinet lighting we are seeing a little bit more of either usb rechargeable or battery powered so if you don't think of everything at the beginning don't worry about it there are always ways to kind of work around but if that's something you know is going to be important for you it might be worth looking into before you get the house built if you're doing any type of built-in maybe that's in a closet maybe that's some type of library style bookshelf you might want to think about lighting there too think through the placement of your security system if that's something you're getting or if you're doing any type of home automation that's also something you want to think about where those panels are going to live you typically want them a little bit more out of the way but not something that's hidden completely you don't want to make it difficult for you to access but again out of line of sight especially that security system you want to make sure that somebody you know peeking in through your windows can't see that you have that it's just an extra layer of protection for you there but these are the things you want to start thinking about for where it's going to be the most useful for you are you the type of person who likes a central vacuum so this is not something that i'm too familiar with i know what it is i've never actually seen one in person it's not something i grew up with i feel like there's kind of two camps people who this is an absolute must-have and other people who are like there's a vacuum in my wall that's weird so this is again something you want to think about if that is something that you are interested in if it's something you feel like is a must then go through the locations where you think it's going to be the most natural the most useful and plot out those central vacuum lines too you can also start thinking about different wiring types that you want hidden so we have something i believe is called a future proof for the tv basically a tunnel that goes from the tv access point all the way through to an outlet somewhere else where you can kind of snake that cable behind the wall to kind of clean up that view of the television so you don't have your cords hanging down if that's something you know that is a look you're going for again you can always do these things later but it gets a little bit more complicated more tricky and probably more expensive obviously with anything looking at the cost now versus later can be helpful with making that decision but something definitely to think about other types of pre-wires are also good to think about now so we know that we need that whole house generator that's not something we purchased through the builder themselves but it's definitely something that we do need for our home so having something like that maybe your home doesn't need one but it's something that's a kind of a want or a good to have think that through same thing with solar panels if you know maybe you're not buying them right now but you are thinking about that for the future again any of these things that are pretty expensive to get corrected later on just think about pre-wiring them now even if you're not doing it right as you move in now once you are done with that appointment you'll have again all of that paperwork you'll have everything totaled up and you do have a little bit of time to review everything and then get back to them you know typically a couple week period before all of that is locked in so i would suggest when you get home maybe decompress for a little bit but make sure you pull that out go back over everything go back over your plans for the home see if there's anything else you missed look at your pricing sheet see if there's anything you need to add or subtract this is that time to really digest and go back to everything and make sure that it is exactly what you're looking for so now we're moving into that third section just kind of other general advice first thing i would say is really consider ceiling fan pre-wires for all of your bedrooms and probably your common areas whether that's your family room your dining room other areas like that where people not just your family might be gathering now personally and i've said it before i'm not a big fan of ceiling fans even though i have had my fair share in the past but here's the thing that at least gives you the option you can always hang a chandelier or a pendant light or something like that from a ceiling fan pre-wire you just keep those wires capped and tucked up inside but if you don't have it and you're only planning for that chandelier and either you go to sell the home or maybe you realize that you really did want you know a little bit more air circulation you get hot a little bit too easily it's much more difficult than to go the other way so having those pre-wires again not only for yourself for now but also for resale value in the future is really going to be helpful because everybody's a little bit different and again it's easier to not use it and have it than want it and have to get it wired later home automation is something we're going to continue to see anything that you can control you know from an app from your phone these are things that you're going to make life a lot easier and we'll continue to see from here on out automate what you can and obviously you need to go in with a budget and having you know lighting is going to be a little bit more important right from the beginning but these are things you want to think about how much do you want to be able to control from your phone from a control panel something along those lines just something to think about now when you're looking at your lighting where everything's going to be going there's a couple of things that you want to make sure you don't have or maybe need to move one of those is going to be in the bathroom you do want to make sure that your light is not coming directly from overhead you'll want to either over the mirror or to the sides if you're doing sconces just keep in mind a light directly over your head as you're trying to say do your hair do your makeup brush your teeth anything like that it's going to cast a lot of shadows and make that mirror very difficult to use so you want to make sure that somewhere where you're using that light for a very specific task it's not going to create unnecessary shadows for you along those same lines think about your lights in your kitchen so right now if i look over to this wonderful apartment kitchen the lighting is set up directly in the middle so we have cabinetry to either side and a light directly centered now what that does is it looks like it provides a lot of light until you go to lean over to use the counter space in any way that light is now behind us meaning that we create a shadow over anything we're trying to do in the counter space i don't know who thought this was a great idea or why they decided on this type of lighting structure it's horrendous definitely it defeats the purpose of being able to use the lighting in your space so anywhere where you have a very specific task you're trying to get accomplished make sure you're thinking through lighting spacing and thinking through shadows we talked a little bit about budget so we know that there are things we need right now but we also know there's a couple of things we might want for the future so maybe you're thinking of finishing the basement later maybe it's going to be you know some type of rec room maybe it will be a bedroom maybe you want this really nice outdoor space and you want to do an outdoor kitchen you might want to pre-wire things for that right now so getting it all put in right away maybe won't be the most cost effective especially if you know it's going to be years until that's actually going to be used but again think through the future think through what you definitely want it to be used for eventually and start planning for that now anywhere whether you can get things done in advance is going to be a little bit cheaper than having to rip the walls out later you might also want to talk to them about being able to have different light switches for different items so i think for right now and i'm not completely sure but probably when we flip on a light switch and we have our recessed lights and our pendant lights or chandeliers it's probably going to control all of them at the same time meaning we don't have as much access to that kind of mood lighting or just differences in lighting then maybe we would want so if you can get them to separate you know your pot lights or your cam lights from your chandeliers from your pendants the same way you would be able to flip on a light switch for a ceiling fan versus having the fan on or off that might be really helpful for you having that control over your lighting is really going to help again maybe it needs to be a little more dim maybe you want everything on maybe you're trying to create a certain mood or a certain atmosphere it's just not an option that you might have automatically so just be sure to talk through with your builder speaking of all of that you do want to think about dimmers as well now i looked back through all my paperwork and i don't believe that was anywhere on you know through this appointment but think that through as well again dimmers are going to be very very useful later on so maybe it's something you have to do afterward but anything again that you can do right away get it done before you move in is going to be great now unfortunately it's really hard to think through absolutely everything you're probably going to get in there at some point think i wish i had thought of x y and z or you get to a point where something you just never would have thought of that you need to go back through and edit later on it's going to be so helpful to have pictures before your drywall goes up so definitely talked about this one before but you want to document absolutely everything that you can if you're able to walk through yourself again pictures video get everything that you need bring a tape measure figure out where those really important pieces for your electrical system are going to be and if you can't make it there yourself ask your builder make sure that you have something that's going to show you where all of this is behind your wall you're not going to be able to see once that drywall goes up so that is everything for this week if there is anything you think i missed go ahead let me know below again i'm really hoping that this is going to be helpful for anybody you know in the building process looking to build a home and these are things that i really wish i had thought of beforehand so hopefully you did find this helpful if you did go ahead and give this video a like again hope you will stick around otherwise can't wait to see you in the next video until next time bye [Music]"

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"VideoID": "7",

"Title": "Electrical Wiring Basics",

"URL": "https://www.youtube.com/watch?v=syaGf\_XUMxA",

"Keyword": "Electrical construction techniques",

"Transcript": "so it's a super cold night here in western pennsylvania i i've kind of taken a break from the framing for a couple days because my friends needed to use my garage to work on their jeep so i didn't get any lumber but i'm gonna be doing the electrical work here pretty soon after i get these beams built in the next video and so i thought i'd take this opportunity just to kind of explain how the wiring is going to go the wiring process uh how three-way switches work how to wire up outlets which wire to use which breakers to use and just kind of give an overview of what i'm going to be doing which will also help those of you who want to do wiring at home it's basically exactly the same principle they would use to wire light in a bedroom or you know down in basement projects or you know wherever you need to do wiring so hopefully this helps you out and as with all my videos this is kind of a you know do this at your own risk this kind of work is dangerous um i've mentioned it with the nail guns and with the table saw things like that um one accident could certainly change your life but it's nothing that is to be afraid of as long as you just kind of respect the tools and certainly respect electricity i know that this stuff really isn't that difficult to learn a lot of people are just nervous because you know electricity is electricity and they always hear about people getting shocked and whatnot but um of course do this at your own risk but this is really simple things that pretty much anybody can figure out [Music] i'm sure you're familiar with electricity in that if you have a circuit it has to be complete and current is nothing more than a flow of electrons around the circuit and all these electrons do go around the circuit but in order for them to flow you have to have a closed loop and that's one of the basic principles of electricity and what i use when i wire is this romax a lot of electricians they'll use the individual strands but i like the romex because it comes with three wires inside so i don't know if you can see that but inside here there's three wires in this jacket and what's nice about it is it's basically one wire that can complete your loop and what i mean by that is let's take our panel box or in my case out here it's going to be a sub panel and i'm going to take power from the box to something like say a switch then maybe i'll come over to a light and then i'll continue back and in order for this circuit to be complete the power has to leave the panel box and get back to the panel box so with this romex it's really nice because let's take just let's get rid of this copper wire and grab it it's freezing cold so i have my gloves on so now let's look at this from the perspective of the romex so we have our panel box oops a little dyslexic today the power leaves the power when i say power it's you know that might say a line's hot or where the electricity is coming from so the power is coming from the panel box through the black wire and say this is where our switch will be see we'll have another black wire that'll come over and hit our light and then this is what completes our circuit is now it'll travel down this white wire and go back to one of the bus bars in the panel box so the copper wire is your ground wire and it acts similar to the neutral wire it provides another avenue for the electricity to get back to the panel box and complete the circuit in outlets it's a safety thing instead of you becoming the short circuit and going from the hot to yourself and and hurting yourself it'll actually provide another avenue to get the electricity back and since this copper wire is more conductive than you are it'll make it back to the panel box and down to the ground safely okay so i drew out some circuits here that are going to represent the circuits that i'm going to use the smaller circuits i'm going to use in this building there's a few more and a few people have reached out to me asking me some questions on youtube and i'll create another video that gets a little bit more involved but the one thing that i want to preface is i i'm not one of these guys that take shortcuts with a wire there's different ways to wire these circuits to save some wire and for me i just like it to work 110 of the time and so i absolutely won't you know use the if you look at some of these circuits online people actually take the neutral wire and they'll make it a hot to get it to run back or run a switch or something like that i don't do stuff like that i'd rather spend that extra a couple dollars and just make sure it's gonna it's gonna work regardless but i've come in to rewire houses before and do different things and you have to sit here and play these little games and figure out where you know where the wires went in these circuits because they decided to use the neutral as a hot wire to go back to lights and different things like that so just for ease of the next person um i certainly don't like to make things more complicated than they have to be so we'll start out with a little panel box that i made here and these breakers put out a couple breakers here and they're all a little bit different and you can tell they're they're always marked what the amperage is the voltage in these circuits is always 120 volts but the amperage is different and that's what you want to pay attention to the white romex is 14 gauge 15 amp wire and the yellow romex is a 12 gauge 20 amp wire and so whenever you're running these circuits you want to make sure that you that you pair up the proper breaker size with a proper wire you can always say put the you know a larger wire on a smaller breaker and that's not a big deal but you never want to go the other way and say put that 14 gauge 15 amp wire on 20 amp breaker then you could potentially cause a fire one thing that you do want to pay attention to with the breakers a lot of them are well they're all kind of specific to certain boxes and so you want to make sure that you use the correct breaker or the compatible breaker for the type box you have so if you have a general electric box you may not be able to use a murray breaker in there and you can see some of the connections that they'll make inside the box are a little bit different they won't always hook up the same way and so you definitely when you go to you know if you want to run an extra circuit for whatever you're doing a garage or basement or whatever you want to make sure that you select a select a compatible breaker to hook up the the circuit in your panel box okay so here's my little panel box drawn out i'm gonna use a 20 amp breaker and you'll see that just like in my last video i have my little bus bars here on the side so for for my sub panel i had to separate the neutrals and the hots so i have the white wire the neutral going to one bus and the ground going to the other bus and my breaker in the middle 20 amp breaker with my 12 2 wire and 20 amp or 12 gauge wire and my 20 amp wire so you'll notice i wrote 12 2 here and you'll notice i have 14 2 down by this white wire and it's a little difficult to understand at first you'll notice that there's three wires in this yellow romex so why would we call it a 12-2 well i don't know that people that manufacture this or whatever they you know electricians or whoever came up with this i guess they're only considering the two wires that are used to like the two main wires to transport the or to conduct the electricity and so you don't count the neutral wire or you don't count the ground wire and so this is a 12-2 wire because it's 12 gauge wire and there's two wires inside if we come over to this little wire you notice it's white so it's 14 gauge 15 amp wire but you notice that it has another red wire it has a red wire so there's a white red and a black wire so this is going to be called 14 3 wire three wires not counting the ground and that's very important when we get to this circuit which is going to be a three-way switch okay let's start with the typical outlet wearing a typical outlet in your home so this is a rated for 20 amp circuit so like i said before we have our panel box or sub panel hooked up so let's discuss what's actually going on to hook this up we hooked up the black to the breaker and then we hooked up our other two wires to the buses then our yellow wire comes along and i use blue instead of the white wire just because i obviously there's no way to draw white on white so i have the white wire that i hook up to the silver screws i have the copper wire which is hooked up to the ground screw and i have the hot which is connected to the copper screws so this is very standard um if somebody hooked this up backwards it's not a huge deal ac power is pretty forgiving there's a whole theory behind it so if you connect them backwards just connect them back the right way i don't really want to get into the theory on how all this stuff works in this video so whenever you turn the breaker on it's going to make the circuit hot which means there's this black wire is going to have power to it it's going to have power clear up to this screw and then to the terminals here and as soon as you plug something in here you're going to complete the circuit so if you plug in a lamp and turn the lamp on your power is going to flow through the black wire and it's going to go through the lamp come back to the neutral and then head back out all the way back to your panel okay that was for a single outlet for two outlets it's not a big deal same same process come over to your first outlet you're gonna hook up your neutral to the silver screw and you're going to hook up the black wire to a copper screw and then with your other screws kind of follow me on this your other neutral is going to come up and hook up to the silver screw your other black wire is going to hook up to the top i would recommend trying to stay consistent make sure that if you hook this black wire up to the top hook up that other neutral to the top of the silver screw and then this wire would go to the bottom this other screw would go to the bottom just try to stay consistent when you do electricity and try to keep things neat so it's easy to follow here you're going to have to actually wire not these copper wires together because as you'll see when i go to actually wire the building you'll notice that there'll be a wire off from this copper wire coming off this be wire nut and then this new this ground will come in then this ground from this other wire will come in it's not good practice to put two wires on one screw and so what you do is you kind of make a pigtail here and connect them all together and then heading down the circuit back to that the last circuit same principle as before just hook it hook it up and just terminate the circuit at the end okay now we're gonna hook up a light and you guessed it we're gonna use a 15 amp circuit with our 14 gauge wire same principle as before we're going to hook up a ground to a bus neutral to a bus and we're going to hook up the black to the breaker and we're going to come over to the switch let's start with the ground this time remember we had a great on the last circuit we had a ground wire and a ground wire from two different wires what we're going to do is the same thing we're going to create a little pigtail and bring the two grounds over and we're going to wire nut them together so we've stayed safe making sure that there's not two wires on one screw then we're going to hook up our neutral wires and the reason is because the neutral wires aren't aren't going to break the circuit it's the hot black wires that are going to break the circuit so as we were talking before you have a circuit and as long as the electrons can flow around as long as the power can flow around in a circle you're good what the switch does is break it at a certain point so the circuit's broken and your light turns off and so what we'll do is we'll hook the one black wire up to the first screw and then we'll bring the other black wire over to the bottom screw it really doesn't matter which side you want to put these on because all you're doing is breaking the circuit nothing's really specific here and so what's happening is when you flip this breaker on we'll go and turn our breaker on just for good practice we turned our breaker on now all of a sudden the circuit's hot so now electrons are flowing or our powers flowing over to the first hot screw you'll see that our switch is off so this these contacts aren't being made but now if we turn our switch on now the electricity is flowing through contacts made through the switch and it goes over to the black wire comes over to your light fixture and then this light turns on and since this is on and completing a circuit the power is also electrons are also flowing back through to your panel box completing the circuit even though i have this little old timer light this works with pretty much any light that you have and a lot of lights i've seen they don't really have places to hook up the ground so don't completely panic if there isn't a place to look up the ground you just take that ground wire and push it way up in the box out of the way and if you have any questions obviously contact a real electrician i just play an electrician on youtube i know what i'm doing but i can't answer all the questions to every situation as soon as the circuit is made here you can put as many lights on here as you want if these are wired correctly which i'll show you how to do that when i'm actually wiring things up and then it'll come and then as you wire these things up the electricity will flow through multiple lights and then end up completing the circuit so really there's really nothing to be overwhelmed about electricity hooking these circuits up is actually pretty simple so i can tell you people are pretty smart just by looking at you and so we're gonna move on to a little bit more advanced circuit and this is a three-way circuit and what this allows you to do is control a light from two different switches and these are used for stairways or in large rooms or if you have two doorways the reason i'm using them is because i have two doors so what i want to be able to do is walk in this door turn on the lights grab a tool do whatever i'm going to do in here and then be lazy and not walk out that door i want to walk out the back door and so what i can do is as i leave i flip the switch off over there and it still turns off all my lights so same principle here we have our panel box and we have our neutral and our ground hooked up to our bus bars and we have our breaker and so same thing the 14 gauge wire the 14 2 wire is hooked up and it's pretty simple at first comes over and it's connected just like we connected our other switch we came up here we hit a screw and we hooked up our ground and then we hooked up our neutral this is where this gets a little bit trickier with the three-way switch your power comes in on the black screw and the way these switches work is as you flip the switch up or down right down right now you have it flipped down so say like this screw would connect to this terminal let's say we flip it up this screw now conducts to this terminal and why that's important is let's say that the hot power is coming through the hot or the power is coming up to this screw then let's say that it conducts across from this screw to this screw and then it goes into this red wire and this red wire and this black wire are called traveler wires so let's say that it goes across to the screw now we follow the red across we come up here now look our switch is down so let's say that this black screw is connected to this screw well now there's no way to conduct a cross to make that to complete the circuit for the light and this is how three-way switches work right now you can have power up to this switch because somewhere power is coming through up to this switch and this is where it's going to break so say that i flip this switch up now let's follow the path of the power i'm gonna run really bad shadows here so now we have the black wire coming over to the black screw comes across to the red to this screw here connected to the red wire comes across hits the red wire now it comes over to this terminal here this screw here now it conducts across and look what it does it hits our light power hits our light goes back through the neutral wire and goes back around back to our panel blocks we've completed a circuit now let's flip this switch off let's see what it does now black wire comes across hits this screw here comes to this screw now we follow the black wire around except for this conducted this way without switch being up now we have no conduction through this screw to this screw which means the power won't make it to the light and that's how three-way circuits work is these two switches kind of work together to break the circuit through these traveler wires and that's why you need a 14-3 wire because you need this extra wire for traveler wires so when you wire this circuit you're going to wire up the switch just like normal just go up to your black screw wherever the power is coming in at and then you're going to take the black wire and the red wire and hook them up to whatever terminal whatever screw you want doesn't even matter but when you come over to the other side be consistent if you hook the red screw up or if you hook the red wire up to the screw on the right do the same thing here and hook the the red wire up to the screw on the right and same thing with the black you just want to be consistent so these circuits are pretty basic throughout your house um there's different outlets and stuff you can use with the gfcis and i'll wire those in later and explain a little bit more about what they are but i just want to do a video on some of the basic wiring i have a bunch of friends and stuff that you know i always do their wiring or i'm trying to teach them how to do wiring and they're interested in learning but uh they just need some some way to get started so i hope this helped you out i really enjoy uh teaching people how to do things um i've got comments that they're like oh you know you do a good job explaining stuff i try i do have a master's degree in education but i don't teach because i think the education system is a little wrecked right now hopefully they'll fix it but i do enjoy teaching people so if there's anything that you'd like to learn i mean i don't know everything but i certainly if you have any questions about these circuits um please put them in the comments and i'll try to answer them so i'm gonna be buying lumber here in a couple days uh now that my friends finished up with their jeep tried to get things a little bit more organized in here and get all my toys in my toy box i don't know this place is really hard to work in right now and i'll work on finishing up a couple small walls that you've basically already seen how they get framed up so i'm gonna hurry and throw up a couple walls and then i'm gonna put those beams on the top and they're not going to be very high they're only going to be i think i'm going to do two by eights just because the span is going to be very long and i'm going to also build them out of some plywood and i'll show you how i'm going to put those together and then after that i'm going to span i think it's going to be two by eights across because i can't seem to find the number one yellow pine i don't know if anybody out there knows where you can buy that stuff number one yellow pines like the best stuff you can spend quite a ways with it somehow nobody in my area has it so that's what i'd like to use but i think i just have to go with a a bigger number two pine board which i'm not thrilled about but whatever so look forward to those videos if you enjoyed this video like share and subscribe and stay posted for when i actually wire this up should be in a couple weeks hopefully i'll get the beam video out and all these beams done next week like i've been yammering on about for the past i don't know a few weeks about getting that done and after that we'll hit up the electrical and get some real lights in here so thanks for watching [Music] [Applause] [Music] you"

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"VideoID": "11",

"Title": "5 Tips for New Construction Electrical &amp; Smart Lighting!",

"URL": "https://www.youtube.com/watch?v=xTpl7WYMkcA",

"Keyword": "Electrical construction techniques",

"Transcript": "oh man look at all those wires now that's a fat daddy right there we're at my house the electricians are about 90 done with the electrical rough-in and on the build show today i've got five tips for you we're going to get into the nerdy details wire gauge how you should tell your electrician to bid it what boxes i'm using what recess cans and even a little bit of my smart lighting controls today's build show is sponsored by halo home let's get going okay guys tip number one the wire and the gauge this is my romex that i used in my house and i used all 12 2 copper now this is what that looks like and this is a slightly thicker gauge than what's often used on production homes or even some custom homes often they're wired in 14 too now when you wire a house in that thinner gauge copper that means that your circuit breakers are all going to be 15 amp whereas all of mine are 20 amp now this is a big deal i'd highly recommend you tell your electrician to wire it in 12-2 but this is going to be slightly more expensive copper is a commodity it varies a lot in cost and the wire costs change significantly in today's dollars it's about 75 bucks for a bundle of 12-2 wire whereas the thinner gauge the 14-2 is about 40-some dollars so we're talking about a 30-dollar difference per roll and i used about 20 rolls on this house so that's you know maybe 600 more to wire this house but here's the benefit all my circuit breakers and by the way the circuit breaker is between a 15 and a 20 basically the same cost hardly any difference my 20 amp circuits are going to pop way less than if i had all 15 amp circuits i've heard a lot from electricians they get call backs because a kid in their bedroom has their tv their computer their hairdryer all these devices on a 15 amp circuit and it breaks whereas if you have 20 amp circuits with that thicker gauge wire it's going to have much less chance of having issues and remember this is a static system this is going to be in the house for the next 150 years working flawlessly so a few hundred bucks more on wire absolutely worth it i'm gonna rip these walls out and uh of course rewire it hey matt what are you wiring that with 220 uh you know 220 221 whatever it takes well you sound like a pretty handy guy yeah well actually these are my 220 wires let me orient you to where we are we're in my pantry this is an exterior wall and outside here is my main panel box in my meter can and these 220 wires right here are running my oven my cooktop my hvac systems that sort of thing but tip number two is right here see this big fat black wire this is number two gauge copper and this is to my sub panel so my main panel is outside with my 220 circuits but my 110 circuits are inside and this big fat black wire is feeding that now the reason why i want to specify copper here and not aluminum which is totally acceptable is that copper number one is not going to have any oxidation issues if we're using aluminum we need to make sure that it's not going to oxidize so we're going to use some of that clear goo that helps the oxidation process stop on aluminum the other thing is aluminum because it's subject to more expansion and contraction it can actually loosen a little bit here in the future and we don't want that the nice thing about copper is once you tighten it down it's going to stay tight and we don't have those oxidation issues now again this is something you want to tell your electrician when they're bidding the project though this one piece of wire is probably a hundred dollars the electrician can actually buy it by the foot at the supply house and this is maybe uh eight to ten dollars per foot something like that in today's dollars if i ran it in aluminum it would be half the cost or maybe a little bit less three to four dollars a foot so this is at least 50 60 70 more doing it in copper but the benefit of no oxidation issues and once i tighten it it's gonna stay tight totally worth it okay tip number three is related to electrical but it's actually an air tightness detail everywhere my wires go from the inside of the outside i want to drill one hole and put one wire through that the reason being is for instance over here where my main panel is and all these wires coming in from there most of the time in most houses even ones i've done in the past we're going to drill a big three or four inch hole and we're going to stuff a bunch of wires through there the hard part about that is once we get 20 wires through this hole there's really no good way to air seal that no matter how much spray foam or you use there's still going to be air into there and if we get air into that space and there's sheetrock back here what's going to happen is eventually that sheetrock is going to have some condensation and some mold develop over time that also can be an entry point to bugs so this is the first house i'm doing it a little bit differently where i did a mock-up on the outside with my electricians and rick put a big square box on that's going to accept all these holes and then we'll feed them up into the main panel box above that allowed me to drill an individual hole for each one of these wires and then i can use a little bit of spray foam here just to kind of seal the hole but on the outside i can use some liquid flash or some prosco fast flash and i can really air seal that really really well on the outside no airflow through there no bugs now let's go to another area of the house that's really common to see this problem okay so this is my pantry and then this is my laundry room space and this doorway here separates my house from my garage space and speaking of air sealing this is a critical space that i see done wrong often on new builds and remodels this wall that separates the house from the garage you can see stops right here where my floor joists are and i've got some second floor joists and my kids bedrooms above me what i've done was i had my framer block that area with some osb in between my floor joists if i hadn't done that the electrician the plumber would be running wires and pipes through that space it would be super hard to air seal that later so by putting that blocking that piece of osb in there now i can then have the plumber and the electrician drill that and again one hole per one wire like over here we've got a bunch of wires coming through you can see i've got each one of those in its individual hole so now i can come back and inner seal that now i could use some close cell spray foam that's a great way to air seal that i could use one of those little spray foam two tank kits i could also use some prosco fast flash or potentially some sega tape on that but whatever method you do you really want to have that plywood in before the electricians show up all right that's it for air sealing next up let's talk about some of the really cool smart home products i'm using let me meet you at the kitchen island okay tip four let's actually talk about some of the fixtures and switches i'm going to be using this is where i'm going to talk about the halo ecosystem now the way i got connected to these guys was i saw this fixture at the international builder show earlier this year and i was totally blown away by it but the thing about smart home that really gets me going or gets me excited is not smart light bulbs or being able to control a bulb in the house it's this right here this is a keypad a multi-room multi-scene lots of functionality keypad but this button right here is what really does it for me this is the all off button so right by my front door i'm gonna have a keypad like this that when i leave and i think you probably know i have four young kids in the house two teenagers and two about to be teenagers i can hit that button and basically shut down the whole house that is a really big deal for me when we talk about smart home though let's talk about how their ecosystem works pretty much all of these products except for one are all bluetooth enabled and they've got a fantastic app for your phone that you're going to bring each one of these devices in that app so that you can control that device we can control things like color temperature and we can vary from really warm or really cool like daylight temperatures we can also control the dimming and they have kind of two different things that we can do we can either control that at the switch which is what this keypad is or these switches or we can control it actually at the fixture now they're bluetooth which means that they're communicating direct to your phone it's not using your wi-fi network we don't need the cable guy to hook up the network to set this up we can all do it from our phone and they're mesh enabled meaning they talk to each other so these devices are going to ping-ponging the signal so that from here even though my security lights let's say are that are also going to be controlled might be 75 feet away on the other side of the house these devices are going to talk to each other and i'm going to be able to be in the kitchen and control this one even though we're using bluetooth now let's talk about the individual devices i mentioned this one being the one that blew me away at the international builder show this is a really really thin led it's a four inch model this is actually there let me get the model name this is their hlb4 this is about 700 lumens 697 but let me show you the feature on this that i think is fantastic i'll meet you on the ladder okay so this is that micro fixture that i was showing you about it's a half inch thick and here's its super power right here they actually call this a canless fixture meaning you don't have the typical recessed can all you're going to do is put this plate up here and then this is going to allow the sheetrock guys to cut out the sheetrock and the electrician is going to direct wire this box right here is going to get that romex wired right into but what's cool about these is because they're so wafer thin they're like a half inch thick i actually don't have to use this mounting plate if i don't want to and in fact over here is my wood ceiling mock-up i've got sheet rock over here but then i've got a three-quarter wood ceiling going over top of that and what i'm going to do is when my finished carpenter is running that wood ceiling across i'm actually going to take this mounting plate off and then the carpenter can mount this wherever it needs to go in the ceiling we can move it so it's really centered in that six inch board and is going to look perfect in the location and then check it out even if it was located in regular sheetrock even half inch sheetrock at a joist it's thin enough you can center it on the joist so you're no longer worried about slamming your can over against the wall to try and get something that oh it's six inches off center no we could actually mount this if we wanted to right on the joist we'll direct wire it connect this and then this will get pushed into the hole the electrician wires it up and then these clips right here are actually going to hold it on to the sheetrock the can or the wood ceiling whatever you want that is a really cool fixture and while we're in the foyer here let me show you something else i mentioned that light switch that multi-room keypad kind of being the real game changer for me i wire the house a little bit differently to accommodate this if you look when you come in here i've got this single keypad right here and you see i've got a bunch of s's right here had i used a regular light switch bank i would have had one two three four switches in this location but instead i've wired just one location this is hardwired meaning power is going to it there's no battery to replace and then when i walk in on my front door right here boom i'll press this number one button and whatever scene i set up whatever grouping of individual lights all those will turn on i could also program button three or four to be party mode or i'm leaving the house mode and again i've also got the all off button i really like that i'm leaving the house i'm wondering if kids closets or bathrooms or bedrooms are on i hit the all off button and everything shuts down on the house now what i've done though is i've wired that a little bit differently i had rick and his guys wire this so that those switches we still have an actual switch location with romex going to it those are in my four-year closet this is where my coat coats will be in the foyer area and all those switches will be located over there those will be halo smart switches and with those smart switches they can either run some standard old-school cans that are not smart lights or they could run halo smart lights it doesn't matter let's go back to the desktop and i'll show you a couple more of those fixtures okay let me show you a few more of these fixtures and then i'm actually going to get into my reflected ceiling plan and kind of show you my strategy of where to use them so first off secondary spaces garages closets that sort of thing this is a fairly thin fixture but it just has a standard box in the ceiling nothing fancy 800 lumen output of that and they make that in two sizes next up in my kitchen i did use a little bit more of an expensive light in my kitchen this is a light that is going to end up having a two inch aperture so a really small little trim right there which is actually two inches but a lot of really high quality light now this is a slightly more expensive fixture this module right here is like 60 65 bucks and i still need to buy a 20 trim for this and this has a pretty normal looking housing like we've used for years so all in we might be somewhere in the 80 to 100 bucks for each one of these between trim can module all that sort of thing and then lastly they have two different models of flood lights on the outside this model has the motion control they also have this without the motion control this is about a hundred dollar fixture so this is probably the most expensive thing on the table but we've got a nice solid aluminum housing when this senses motion on the outside i can set the app to say hey turn on the sidelight houses the side lights as well in the house or even turn on the kitchen lights so that it's someone who was prowling in my yard would think that i'm home because multiple things are coming on not just this motion sensing floodlight the other thing i can do is i can set up individual lights or switches on the app up to 200 of them by the way and then i can group those together into specific areas of the house and with that let me transition the plan and show you that real quick so this is my reflected ceiling plan my architect and i went through and decided to gather on this and i color coded this so that my electrician would know exactly what goes where so here here's the different halo fixtures that i used on the house and here's where it is if you want to pause the video here you can get a full view of this and you can come back and refer to this later if you're interested in helping this design your house but briefly i did a bunch of these rather inexpensive ceiling mounts in my garage so that everywhere in my garage i've got some really good light in the kitchen i use the most expensive light that's this one right here and then as we transitioned to the foyer in the dining room space where i've got the wood ceiling and i really wanted to make sure these were put in the exact spot i went with the the tiny fixture that way this guy this micro edge can be placed exactly where i want it in the boards in the living room i've got a slope ceiling so i use a slightly different can this is one that will adjust to the slope ceiling area and then in the bedroom i've got a couple cool things going on that i'm actually going to show you that in one second but let's also briefly touch on the second floor in the second floor i used a variety of different fixtures from halo in there from some surface mounts inside all my secondary spaces like closets to these four-inch cans just about everywhere else i really like their system these guys have really thought about it and as i mentioned earlier pricing wise everything on the table here is really well priced this is definitely a common man's smart home system i've used the big l on a lot of jobs and they make some fantastic systems for lighting control but man they can get expensive so for the functionality that we've got here this is a really nice system alright guys so this is my front door in the house and we're on the front porch now tip five i'm going to talk to you about some specific boxes that i use in the house that i think are really interesting and i'm also going to walk a few places the house and show you just a few general tips of what i did electrically so first off generally speaking i really like soffit cans on my current house i added these later and man they are really nice i just have a couple cans here in this soffit and then i've got two more in front of my garage bay i like the light from those a lot better than sconces i feel like they really light up the area and they're not directly in your eyes then i also ran some standard cans on the porch to light up this porch area and then my guys made these boxes right here which are gonna accept my siding and then eventually i will have a sconce on either side of the front door but i made a mock-up to try and figure out the details earlier and let's look at that this is a vertical box and this happens to be a product from arlington they call this the inbox from arlington and they make it in a bunch of different flavors and varieties this is one that's intended for stucco but this one right here is for siding and if you look at this mock-up on the side this box could actually recess into the wall and you could spray foam that or do some other air sealing but because i was going for extreme air sealing what i wanted to do was have that box outside of my zip sheathing which is really my water and my air barrier in the house and then after that wire comes through you can see here we've added some prosco fast flash it looks like a caulking but in fact that's that's a liquid applied waterproofing agent that also does a great job of air sealing and now those two wires will eventually have this box put on and this is an in-use cover box you can get it in this kind of clear color i'm actually going to do white on most of the house so you won't see into it but they've got a little spot here so you could actually have something plugged in the cord would come out and you can shut it and that's why they call it a recess box because one that covers closed you could still have something plugged in and it doesn't stick out like those really ugly bubble covers all right uh let's transition from here to the master bedroom and i've got a couple cool things in there i want to show you okay master bedroom on the same theme of tip 5 for specialty boxes another specialty box from arlington that they make is this one and this is an airtight box and this is great to use on exterior walls because air that might get past your exterior air barrier is going to get stopped at that box now i'm actually not doing it for that all my heavy lifting for air barrier for me is on the face of the zip but you'll also notice i use these between the master and the closet and i'm using this on some of my interior walls for for sound reasons i'm trying to reduce that sound transmission between rooms now it's not as big a deal to reduce from my master closet to my master this is actually my bed wall right here but i wanted to do these in a couple places now full disclosure arlington did not sponsor the video but they did give me some free products so i wanted to try these out of my house i'm curious how much of a difference that makes but i think for sure using these on the outside on a kind of standard construction house would definitely make a difference so i'd highly recommend those boxes there one other tip you'll notice here though i mentioned this is my master bed wall my vanities will be on or my pardon me my nightstands rather will be on either side i really like putting double outlets on either side there that way your iphone charger your clock whatever else you plug in you don't have to worry about putting a power strip there having that double outlet so much better and then as we go into my master i want to mention a couple things that i wired that are a little bit unusual i'm doing a heated floor system from schluter in my master and that's what this conduit is this is a little bit atypical but i'm really excited about having a warm floor so what we do is the electrician is wiring that and this is a 220 hookup so i've got a 220 wire here and then these two cables are blank right now when my tile guy comes that's when we'll actually feed the wires from that schluter heated floor mat into here so we're all set up for that in the future okay next thing i wanted to mention that's a little bit different electrically is i've got a wire here that will eventually get hooked up into my roburn recessed medicine cabinets i like the fact that i could have a plug they have an option to put a plug inside their medicine cabinet so now my electric toothbrush can be plugged in and ready to go and not be sitting on the counter stay tuned for a future video on that because i actually have some sconces that are built in to those medicine cabinets that are going to give me really nice light on my face and then lastly let's transition in the closet for my last bit of luxury that i added on my house that's getting wired up this is a mr steam towel warmer and man i'm excited about this what this is is an oil filled rack it's kind of heavy it probably weighs 40 or 50 pounds and this is going to heat my towels and dry them quicker and allow me when i jump out of the shower which is right there to grab a warm towel now this is a direct wire fixture and i also needed to put some blocking in i've marked it but i haven't put it in yet i need a couple of two by sixes or a 2 by 12 there so i can direct mount this on and then rick the electrician when he sets this out at the final will have this wire direct wired into this unit i'm really excited about that guys that's it hopefully you learned something today about new construction electrical both on a few of the products that i use and also how to bid this with your electrician big thanks to my friends at halo home they really won me over at their booth at ibs and i'm excited about using some of their products but i'm also really excited to share with you because i feel like their system is really reasonably priced it's available to all the home centers these devices that i'm talking about using here they're only maybe 20 25 percent more than kind of standard dumb devices with a lot of functionality and i also like that there's no weirdo low voltage or you know wireless or battery operated everything gets wired with normal wires so that someday if i want to change those out it's going to be really easy to do that guys if you're not currently a subscriber hit that subscribe button below we've got new content here on the build show every tuesday and every friday follow me on twitter instagram otherwise we'll see you next time on the build show [Music] [Applause] [Music] you"

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"VideoID": "12",

"Title": "How to bend and install electrical conduit",

"URL": "https://www.youtube.com/watch?v=A0cXKa4Y3do",

"Keyword": "Electrical construction techniques",

"Transcript": "do a little bit more what's up guys so today i'm \nout in one of our site builds this is a shed that   we've actually built on the people's property \nthere's no trailer involved and with that comes   a lot of city inspections both framing but also an \nelectrical inspection so in this town they require   metal conduit and steel boxes now i used to be an \nelectrician when i first got into construction i   actually really enjoy electrical work and bending \nconduit and things like that but i understand it   can be really challenging if you've never done it \nbefore so today i want to teach you how to install   the steel boxes and also how to bend conduit and \nwe'll go through some different bends some offsets   how to measure the 90s and things like that \nand also how to drill up through plates through   the joists using a cordless drill and how to \nproperly strap your pipes and everything in place   so really start to finish how to rough in electric \nusing metal conduit tubing and steel boxes   so let's get started this is what they call a \n1900 bracket box now i'm not sure exactly why   they call it a 1900 box but it's a pretty standard \nterm in the electrical world the reason they call   it a bracket box is because it has this nice \nbracket on the side here and that's going to   come in handy when it comes to mounting these on \nthe studs the other thing you're going to need   is some deck screws now this is now code that \nyou can't use roofing nails to nail these boxes   and you have to use a deck screw now i just happen \nto have these white ones and so that's what we're   going to use but you have to use some sort of \nexterior grade screw it can't be a drywall screw   and the reason is because you have a galvanized \nbox and then you'll have if you have a drywall   screw it'll actually rust itself out so you got to \nuse something that doesn't uh create electrolysis   between the fastener and the box so let's go ahead \nand mount one of these up i'm going to mount the   switch first now what's cool about these boxes \nis a couple of things they have these little tabs   that hugs the face of the stud right here \nand then you also have these little set   markers right here and what that's for is you \nline your box up with your line now i make my   switches at 50 inches off the ground it's pretty \nstandard hammer those little spikes and then it'll   hold it in place then you take one of your screws \nsend it through one of the holes you know one on   the top one on the bottom and that's it so i'm \ngonna go ahead and put all the outlet boxes in   so that we can get started on the piping so \none of the things that i strongly recommend is   to mount all your boxes before you get started \nit'll make everything go a lot faster the reason   it'll make everything go a lot faster is just get \none task done so then you can switch to a drill   and then you do all the drilling and then you \nswitch to a saw and a bender and you do all   the bending of the conduit so i really like to get \nall the boxes mounted before i start anything else so that's all the boxes that we needed to mount \nfor this little shed now what i'll do is i'll   start laying out how the whole thing's going to \nflow together so whenever i'm trying to explain um   electric to somebody who's never done it really \nbefore or how to run it one of the things that   i'll always say is just imagine it's like a it's \nlike a flow of water right so it's got to start   somewhere and it's got to end somewhere else but \nit does not have to create a loop it just needs   a start in a finish so when it comes to piping a \nsimple little shed like this there's a lot of ways   to make this go really fast i've already gone \nahead this box right here has a pipe in it and   through the wall to the back side is our exterior \nelectrical panel so that pipe is gonna bring in   all the power to the whole little shed so it's \ngonna have a circuit for our baseboard heat it's   gonna have a circuit for our outlets and it's also \ngoing to have a circuit for all of our lighting   now we use a little wafer light they're really \neasy to install and they're super thin and they're   led and then what i like about them is they have \nthis little switch thing here to change the color   temperature of the light so we like to put them \nlike a 3 500. now i've temporary mounted all these   boxes but they're going to need pipe between all \nof them so i went ahead and disconnected these so   we're not hitting our heads on them now that we've \nmounted all the boxes in the room it's time to now   put in what we call our connectors zinc connector \nset screw for half inch conduit it has this little   ring right here and i'll show you how these are \ninstalled so first things first load up the pouch   so you don't have to walk around \nand grab a bunch of stuff this is   something new by klein tools it's really fancy got \nsome wire strippers in there this actually works   as a conduit reamer and then this tapered pump \nnose to here this will knock the knockout ring   right out like that or you can use a more \ntraditional style which is a pair of um i   like the 430 channel locks and then they come \nwith the blue grips on them and then i take a   razor blade and i take those off because you'll \nsee why in a second this is probably my favorite   way to rough in electric i've already taken \none off the top we're going to need one to   go down here and into that outlet so \ni'll just take one out at the bottom then we take our we take our box \nconnector comes apart like that   top goes in there ring goes back on on the bottom \nside and then i'll typically just hold the ring   and then i'll spin the fitting it's the fastest \nway to do that and i kind of tighten it like   that where it's kind of facing off to the side \nthen i come back with my channel locks and i   give it a good twist and you'll feel it you'll \nfeel it bite down and you'll know that it's   really tight it's important that these are \ntight because in whenever you're piping the   electric in the ground is the pipe so you want \nto make sure that these rings are super tight the next step is to drill all the holes first \nthings first at what we got going on and kind   of visualize where the pipes are gonna go \nand how they're gonna get to wherever they   need to go the first thing i know is this pipe \nright here is gonna go right into the side here   and then this pipe needs to come up come across \nthe wall and drop in over here and then this pipe   is going to come up into the ceiling catch these \nlights this is exactly why i don't recommend   putting corner to corner because the lock rings \ntend to collide with each other another thing   that i don't really recommend is whenever \nyou're doing outlets don't put anything   in the center knockout on the side because \nthat's where you're when you put your   screws for your outlet in you don't want your \nscrew to go through and hit your wires or if   you're going up and down try to avoid the center \nbut our outlets are going to go horizontal so we   want to make sure that we just avoid the knockout \nout the middle whenever marking out our outlets   switches holes all that kind of stuff i like to \nuse milwaukee ink saw marker our outlets are at   16 inches off the ground to the top of the box \nthat's typically what i like to put them at   when marking our holes i'll typically go like \n24 inches off the ground you definitely want to   be more than six inches taller than the box and \nthe reason is the actual 90 or the elbow when we   bend a piece of conduit if we make it as short \nas possible that's six inches itself so we want   to have it a little taller than that so we have \nsome room to work with it if we need to put an   offset or kick in it so 24 30 inches it all \njust depends 24 is a nice easy number to do this bit is actually an inch and a half it's \nall i had in the truck so it's actually a   little too big but we'll put some nail straps in \nthere to hold the pipe nice and tight and then   i like to just take the center of this and just \ncenter it on our line it's a really big hole   for this i don't recommend this bit for this but \ni mean it'll work but you want to leave something   here so that any fastener that goes through \nhere isn't going to go through the pipe we'll be   nailing our uh conduits to the back of these holes \nto keep them away from the face of the stud so let   me go ahead and drill these holes the center \nof this connector then i take my marker and i   just line it up with two and a half and then make \nmyself a mark same same process applies to going   through plates as going through the studs the \nonly thing that i check is i kind of take my hand   check for nails because you don't want to sharpen \nbits every time you blast through a nail so then   it helps to have a ladder these little sheds the \nceilings are so small that we have a couple of   these step stools so what i went ahead and did \nputting the pipe in here and it makes it easy   to cut the pipe the first thing i'll do is i'll \nmeasure to the back of this fitting right here   and i'll see that that's like three quarters \nand then i'll take a measurement from here   to the edge of the box ten and a quarter so \nwe're going to go nine and a half to our 90.   every bender is a little different so on this \nparticular bender this is for half inch emt   conduit it says it right there it says stubs \nfive inch to the arrow now what does that mean   so we take a piece of conduit we said that our \npiece our 90 needed to be nine and a half inches   long so here's how this works and i go four \nand a half now why did i go four and a half   well because this bender says that the 90 stubs \nfive inches to the arrow we take our number which   was nine and a half and then we go five inches and \nthen it brings us to this mark so the easiest way   to remember this is make your mark or however \nlong your 90 needs to be at nine and a half   come back here five inches make another mark \nthen take your bender see the arrow put the arrow   on the mark just like that line it up put \non the ground and apply straight pressure   to this foot head right here so straight \ndown and then you kind of look at it   and when it's straight it's straight and then \nthat is your nine and a half ninety so then   you can check it take a tape measure have it \nflat have it standing up and then you check it   and it's at nine and a half so the second \nstep is then we lay the pipe down like this   take our bender welcome to working in a shed it's \ntight spaces take your bender put it like this   take the 90 and just have it squared up \nlike this and i'll show you why in a second   so the second step is you got to figure out how \nlong this piece needs to be so what i like to do   is i'll just measure right to the top of this \nplate and it's at 13 it's at 13 and a quarter   so then i'll measure this which is at 47. \nnow a lot of people might have tricky time   with the math on a tape measure if you're \nnot used to it so here's a trick for you   come over here and you mark 13 and a quarter \nright here just a little mark on the stud and   you hold your tape measure like that and you'll \nsee that it's right there at 33 and three quarters   and we put it right to the bar make sure we're \nsquare and we go 33 and three quarters and then same thing now you'll see why i like to use \nthese channel locks so the first thing i do   is i take the top end and i dream this out so i \nget all those burrs off of there remember wires   are going through here so we don't want to cut \nanything then we take the other side of it bring   it down like this check the other side this is \na factory finish so it doesn't have any burrs on   it but i still like to dream it out a little bit \nthen take our piece of pipe put it in here first   so it goes up in there swing this around if it's a little off you can \ntake your bender like this   so take my bender stick it in there like that \ni'll just kind of pull on this a little bit that's it take our screwdriver   okay so now there's a problem because i'm not \nused to doing this like this i'm just used to   working so um one of the problems that we just \ncame into is we have a hole here right we're   supposed to have a pipe that goes through here \nand it's supposed to cross over and go into here so i went ahead and changed our piece \nbecause we were blocking that hole   and uh you know it's one of the nice things \nabout working with conduit and stuff like that   it's it's pretty simple to change it up if things \naren't working out if you got to move something   if you need to cut something so here's another \ntrick you can just put it in the in the fitting   hang it down take a look at it take your \nthumb like that just like that i got my   thumb i haven't moved it yet take my saw and \ni just line it up and then i take my thumb out   you got to remember to do this this is a rookie \nmove if you don't if you don't ream the pipe and   then you go to pull all the wire the little \nburrs and stuff if that's sharp it'll cut   the wires and then drop it in send it home \nyou got a nice piece and then that's that okay yeah we crossed intersections a little bit \nso the next pipe we're going to put in is the one   that goes across the wall into that outlet we know \nthat we're at 24 inches the top of the box is at   16. 24 minus 16 puts you at take a short piece \nof pipe as my father would say don't be a hero   don't try to do the thing in one piece because you \njust end up struggling you do it in a couple of   pieces to get across the wall because you're \nnot gonna be able to get the pipe to slide   through the wall so just grab a small piece to \nstart out to get out of the outlet we're gonna   go eight inches for our 90. so we take our tape \nmeasure we mark three inches and we bend our piece   just like that clean on our ends then we go ahead \nand take our pipe send it through our hole drop it   in now we said we were gonna put our pipes to the \nback of these holes so before we go any further   you see how like when i push this pipe to the back \nof the hole and we're all we're off our hole now   now we're angled in the wall so what i need to do \nis i need to do what's called a kick on the pipe   so i need to put a bend right here that sends this \nback and brings that pipe more solid so then what   we'll do is take it out lay it on the ground it \ndoesn't need a lot just needs a little bit just   enough to keep it straight in the wall so just \njust pull up on it a little bit that's enough   just to put a little kick in there \nnice and flat to the back of the hole   if you got 16 on center like this the best number \nto re uh or go with is something that's you know   on a 16 on center so you could do a four foot \npiece here and i'll show you why staying when   you're cutting the pieces that go in the middle \nbefore you get to the other outlet staying with   16's on center we'll go 32 actually so we're \ngoing to cut a piece 32 and i'll show you why   16 on center is a really fast way to not make to \nnot make a lot of mistakes so i'm going to take my   i'm going to measure my piece i'm \ngoing to cut us a 32 inch piece of pipe again hopefully you have a bigger place to do this \ntype of work than in a little shed doing this in   a shed like this challenge okay now we've got our \npeaks let's dream it out i'll show you why cutting   that at a 16 inch increment is so important so you \ngot it right here see it gets a little tricky find   your spot pull it in front of the hole slide it \nthrough and now when you get all the way through   you take a coupling put your coupling on there \nlike that tighten it down the reason i cut it   at 32 inches or 16 or 48 or whatever because i \ndon't want to end up in a hole you run the risk   of getting really close to the stud and it becomes \nvery difficult but if you look at this because i   cut it on 32 i end up at the same exact spot away \nfrom the stud as i did over here which just makes   things more manageable to work through and two \nstuds is about as much as you're going to get   through it so now we got to cut another piece got \nto come up out of that outlet and go into here   again we're going to measure our 90 to be eight \ninches so we want to go eight so make a mark at   eight move the tape measure back to five because \nthat's our half inch bender is five or minus three   either way and then we take that top mark put it \non our bender just like that line that arrow up now this is a nice way to do this so i put it \nin the fitting i look over here again i like   to use that thumb go where my mark was ream \nour pipe and then we send it through the wall before we put it down in our box though we're \ngonna put our coupling on slide it through   make sure that these bottom out sometimes \nthis screw see this screw that's a problem   i'll show you what i mean make a mark right here \nso you can see it watch what happens it's really   important to check these screws because the pipe \ncould fall apart in the wall when you're trying   to pull the wire the screw this screw is too \ntight so see when i unscrew this until it went in and then tighten this one down first and then send it home into the box \ntighten this down tighten this down   oh we didn't put a kick on our piece \nso we got to put a kick on this one too   whenever you're piping outlets through the \nwall typically whatever you do to one side   you're gonna have to do the other another way \nto do that piece is you look at it and go okay   ben needs to be on this side so another way \nto do it really fast is you could just stand   the bender up like this look at your piece make \nsure that that's parallel and then just push down   that's enough just eat a little bit and \nthen you put it back through your wall   put it back into our coupling and then put \nit into out then i did a little too much   another fast way to correct the problem \nis you could put it in the stud don't   ever pull outward but you can push upward \nlike this watch we just lift up on this take a little bit out of it go \nback through our holes line back up and go right in tighten our connector down now \nfor our next step see how difficult that is   there's a little little bump in there it's made \nfor this hold it right there take your hammer nobody it doesn't fall out it's a nice way \nto put the strap like this is a good spot   right here take that strap and take the big \nscrewdriver put it right there and you use   the side of the stud to hold the screwdriver \nin place and you just leave it on that knot   and when it gets to there knock it \nin with the screwdriver a little bit   that's that well look i hope you've enjoyed this \nlearning how to put the pipes through the wall   i'm going to finish this whole thing up \nso i'm going to let you go let me do my   thing but uh if you have any questions about \nanything related to electric whether it's   piping or wiring or want to see other videos on \nthis subject it's actually something i know a   lot about and i would love to teach you guys as \nmuch as i know about one of the trades that got   me into construction and one of the things that \ni love so much so you leave your comments likes   and all that fun stuff below and if you haven't \nsubscribed please do and we'll see you next time"

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"VideoID": "13",

"Title": "Construction workers can&#39;t believe this machine. Incredible modern construction technology.",

"URL": "https://www.youtube.com/watch?v=nJIe2E3\_c1U",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign hi everybody a little later in this video you will see various Technologies used in construction today new technologies and construction are being developed at a Breakneck pace imagine what the job site would be like today without construction technology in a construction where there are no electrical tools or heavy equipment things would be very difficult don't forget to subscribe to the channel and like the video let's watch our video now [Music] staircase ramp mold [Music] automatically adjustable staircase ramp mold with Landing this system is used to make ready-mixed concrete stairs using formwork [Music] after the iron skeleton is put into the mold the concrete is poured and the ladder is ready after it dries [Music] foreign [Music] dumpster [Music] a compact walk behind High tip diesel-powered mini dumper the machine has been designed to save time energy and money [Music] we can call this machine the technological state of wheelbarrows it is very useful and modern [Music] precast concrete [Music] I guess this is one of the easiest ways to build a building in this system the walls of the building Etc are manufactured in the factory and only assembled at the construction site [Music] thank you [Music] Precast construction can provide reduced time on site reduced propping slash scaffolding costs lower site labor costs and lower material storage costs [Music] thank you reduced environmental impact Manufacturing in a controlled Factory environment is more efficient than traditional construction with less noise air pollution and debris on site the uses recycled materials in production and allows benefits of thermal Mass to be incorporated into designs [Music] slip form concrete Paving [Music] power Kerber 5700c slip form Paving machine pouring concrete curb using topkin millimeter GPS system in Australia the power Kerber 7700 is a truly multi-purpose machine designed for various offset and Paving applications [Music] this machine is used in Highway barrier wall and road paving works [Music] it is very enjoyable to watch The Works done with this system it's almost hypnotizing [Music] concrete deconstruction robot ero is a concrete deconstruction robot designed to disassemble concrete structures and enable the building materials to be reused for new prefabricated concrete buildings ero uses water jets to crack the concrete surface to disassemble concrete and socks up the mixed debris it cleanly separates the waste mixture and packages the clean material what was previously waste now turns into labeled packaged asset to be transferred right away into concrete precasting stations to be remolded into new building blocks no dust no waste no separation only clean bags of aggregate and rust and dust free rebar remains to be cut and reused directly [Music] concrete finishing and compaction [Music] comprehensive concrete finishing and compaction equipment makes work very easy [Music] by definition construction technology is the collection of innovative tools Machinery modifications software Etc used during the construction phase of a project the whole purpose of construction technology is to help push the industry forward to drive advancement in Innovation and increase efficiency the general sentiment around construction and modern tech is that the industry has been slow to embrace it while this is true of the past the current and future construction industry is all about modern technology therefore technology has a very important place in the construction industry [Music] [Music] we have come to the end of the video I would appreciate it if you liked the video and subscribed [Music]"

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"VideoID": "14",

"Title": "Safety Warning For The New Apprentice #knipex #knipextools #electrician #electrical #construction",

"URL": "https://www.youtube.com/watch?v=8sO2MOQWh8U",

"Keyword": "Electrical construction techniques",

"Transcript": "want to see something cool I'm about to save your young life this is a pair of kpex wire cutters they cost about 50 bucks right now on Amazon they're amazing and I love them almost as much as I love wet beavers boats and you they'll cut all manner of copper and aluminum wire if you can fit it in there they'll happily try to cut it I use them every day this is a pair of kpix high leverage Cobalt bolt cutters they cost about 60 bucks and it'll cut through anything you can fit in the Jaws they even work for pulling Staples in a pinch properly cared for either of these tools will Outlast your grandchildren's career these are quality tools meant to be handed down but the very first time you try to cut nails or pull Staples with my wire cutters they become dented and about as blunt as the head of my dick and the only thing they're ever going to be useful for after that is taking your teeth out"

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"VideoID": "15",

"Title": "Electrical 101: Basic Wiring Knowledge",

"URL": "https://www.youtube.com/watch?v=2noHrGkGuhQ",

"Keyword": "Electrical construction techniques",

"Transcript": "alright guys I know it's been a while so what I want to do is just make a little intro video here maybe this will get the ball rolling so I've been working on this panel right here for the rest of this day just got that grounds and the grounds on the side over here and here and then the neutrals down on the bottom as far as I can go and then the black wires I just kept them all off as you can see all those here we got all the wires coming in so a lot of you might not know a lot about electrical but basically this is your power source here you have a wire coming out the bottom this is the power wire and then the power is coming out from this box and it's going over bringing power to this box and then these two wires go to the lights which is also called your switch leg so one of the wires goes to this middle light that one and then the other one goes to these five lights around here and then as far as making those up it's a little more complicated than that but basically the block in each wire you have black white in the green and so the black wire is the power and because you have two switches here you have to split that and make it into two power wires and which is these two because those two that are kept off so it's safe and doesn't explode and then the other two wires one is the other black wire for the switch and the other black wire is this for the switch so you have two wires on a switch a power wire and a switch wire and these are the switch wires this is the one that goes to the one light and this is the one that goes to the five lights so that's if that made any sense to you that's what's going on tie all your grounds together tie all your whites together and then that's basically what's going on you got your hot wire and your switch wire right here switch wire hot wire hot wire and then switch wire so that's that's how that works and then for plugs and basically just tie all the blacks whites and greens together to their own colors and then that's how that works so you'll have a black white black white and green for the plug and then furred like a counter GFI same thing a little bit different but you tie all your greens together and the black and the white stay together because they're gonna be the power side and then the load side which is protected down the line for so this will be protected this wire is the one traveling from here all the way down to this plug right here so when that GFI trips it'll it'll it'll trip this one as well so like if you trip this one it'll turn that plug off until you reset it so that probably doesn't make any sense to you anyways this is what we got going on here so you got the panel there two switches in that box one switch on that one switch on that box that's a plug which goes to that plug and then so basically these are all the home runs that which means it's just the power source go into a box so like I showed you this is a home run right to this box and that power jumps out to this box and I got another home run going up to this box a home run going to this one box a home run going to this box and then all the others home runs go to different places but a lot of them one goes to this outside box and jumps of that box another one goes to this box and jumps over to this box and then this one gets a home run by itself this one gets a home run by itself and then this is the dishwasher so that's a home run and then the microwave gets a home run and then we got some plugs one over there and then this plug jumps from the jumps from this this is the home run for that plug and then that jumps over to here to bring power bringing the power over to here that power comes out of there and then goes up to the TV right there and then from there it hops over to this blog down there that's a home run for the fireplace that's a TV and data and then another home run comes over here for the lights my coworker did this one so a home run over here for the lights one of these goes out to the sconce lights between the TV so those two lights are on one switch and then the other switch this is for the fireplace so the home run comes to here and then the switch wire for the fireplace goes out to there so that's one switch and then I forgot what the other switches for here anyways that's about it one of these is a sconce lights and the other one is like these twelve lights as you can see here we got like four rows of three so one two three one two three one two three one two three so that's basically what I've been working on this week then you got all the wires up here this thing is so annoying oh my gosh anyways you got all the wires running up there through the top so if you don't know anything about electrical maybe that helped you out anyways that's what I do on the daily so got a thorough strap in there and stuff like that so anyways just thought give you guys a little update and then the home run the home run for the stove we just put that in which she goes I worked it there so you might need to strap that a little bit maybe not anyways so that's what I'm going with about time to about time to go home but I just want to show you what I'm working with here so I'm gonna head home after this and anyways thanks for watching I appreciate it as always thanks for stopping by god bless have an awesome rest of your day and hopefully I'll catch you really hopefully I'll catch you real soon in the next one so see you guys peace balls [Music]"

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"VideoID": "16",

"Title": "Avoid Costly Mistakes |Electrical Walk-through Checklist for New Homes |New Construction Homes in GA",

"URL": "https://www.youtube.com/watch?v=dJOAA9RPf\_c",

"Keyword": "Electrical construction techniques",

"Transcript": "if you've never built a house before you may not be aware of everything that's involved with the electrical walkthrough the truth is that the electrical walk-through process is long and it's grueling and very tedious there's tons of things to think about and plan for and you're going to want to give it a lot of thought before you attend the electrical meeting in this video I'm going to give you some of my best tips and tricks for how I handle electrical walkthroughs as well as getting you started on a checklist for all your electrical needs including a bunch of things that you probably haven't even thought of so let's get started [Music] foreign with you first make sure that you bring your checklist that you've been working on and any questions that you may have or things that you want to discuss or talk through that should be listed on your checklist so that you make sure that you cover everything before you leave I personally bring a clipboard with me with my checklist I also bring pen and paper for note-taking what I like to do for my clients is take notes on anything that we've added or removed basically any non-standard personalized requests then after the meeting I type up these notes and send a copy to my client one to the on-site agent and then a copy to the person who conducted the electrical walkthrough to me this is a very important task this way everybody is on the same page and if there's a misunderstanding you can get that cleared up early in the process also there's just written documentation of what's supposed to happen so that when we do the next walk through if it's not done as expected we have proof that what we discussed didn't happen and there's no argument about it remember there are always things that are going to be missed and it's not a big deal as long as they make it right and without incurring a cost for you so in addition to your checklist make sure that you bring a measuring tape and any dimensions of furniture that will impact the electrical placement for example if you're doing sconces on either side of your bed you're going to want to make sure that you have the measurements of your bed frame and the end tables so that you can make sure that everything is lined up properly so now that you know what you need to do and what you need to bring I'm going to go over everything room by room and give you some ideas and talk about some of the things that can easily be overlooked hopefully this will give you a strong starting point for your electrical checklist number one the exterior of the house I like to do outlets on every side of the house they always come in handy also think about your front and your back porch lights some people do lights but a lot of people like to use ceiling fans to keep the bugs away think about an outdoor television if that's something that you're going to want to put in some people put it over a fireplace but it doesn't have to be as long as it's covered it could be on any exterior wall think about flood light placement it's very common to have them by the garage but also think about garbage cans and pool equipment that you're going to have to access at night time if you're a gardener consider landscape lighting if you're into sports consider Sports Court lighting like a basketball court or a bocce ball court also think about soffit lighting lighting that goes right up there in the soffit which really helps if you're into hanging Christmas lights or string lights and then if you do that definitely make sure that you put a switch to those lights on the inside of the house so that you don't have to go outside every time you want to turn it on or off also think about whether or not you're going to be installing an outdoor kitchen if you are run electrical to that spot and also make sure that you can get a gas line as well well as a water line that all will make it much more affordable to install your outdoor kitchen whenever that time comes number two the garage first of all make sure that all four corners of the garage are properly lit I recently did a walk through with a client of mine and for some reason the builds are only allotted for one little can light to light the entire garage so we had to add lights for all four corners just to make sure that she could you know use her workbench or you know access her breaker box at night so that's something that you really really want to think about also think about where you want to put the breaker box so that you have easy access if you know something trips and you have to go out there and reset it you don't want to be having to look all over for it something easily access will help you out in the long run also if you have an electric car or if you're even thinking about getting it I would go ahead and have a 240 volt Outlet installed and if you have a double garage put it in the middle so that both cars can access it it will definitely definitely be a game changer when it comes to charging a car doing it with a regular outlet is way too time consuming also are you gonna have a cordless vacuum cleaner a lot of people put in the garage or maybe the pantry or a closet definitely plan for that and if you don't have one you definitely need to get one number three the living room are you going to have built-ins in your living room and do you need to have outlets in them if you're going to use one of those photo frames that need electricity or a little lamp do you need task lighting or book lighting within those built-ins think about floor Outlets are you going to have a console table behind your sofa that's going to have a lamp on it and potentially need some electrical or an outlet below that also think about your TV where are you planning to put it are you going to do a flat screen on the wall or over a fireplace and if you're doing that also consider running the tube that houses all the wires and runs it through the wall to the bottom so that you don't see all those wires coming down from your television also if you are thinking about getting a frame television consider putting an inset in the wall there so that it can house the actual Hardware the brain of the television there and it doesn't have to go behind the television to where it makes the television protrude from the wall and kind of like it takes away from the whole idea of having a frame television which is to make it look like a piece of artwork of course always consider your furniture placement and whether you're going to be putting end tables on either side of your sofa because if you are you will most likely want lamps there which will need sockets number four bedrooms ceiling fan pre-wires now even if you're not a fan of ceiling fans I suggest you go ahead and get it pre-wired because at least that gives you the option if you change your mind and you decide you want one down the road also think about whether whether you're going to be doing pendants or sconces on either side of your bed or if you're just going to opt for a lamp now if you do decide to do pendants or sconces I suggest that you have a dedicated switch on either side of your bed within reaching distance to avoid you having to get up and shut off the light when you're about to go to sleep it's very convenient I've done it now in my last few houses and I've grown to love it and I don't think I would ever go without it at this point so it's something I highly suggest also think about television placement in your bedroom are you going to need any incense what wall do you want to have it on and also think about your closet you may need some can lights in your closet or you might need some lighting in your built-ins if you decide to put that in later on number five bathrooms it's recently become very popular to have Outlets installed in your drawers and inside your cabinets for toothbrushes and hair styling tools if you can have or if you decide that you want to have overhead lighting in your bathroom you're going to want to make sure that it's not directly over your head and that it's positioned more over the mirror or on the wall otherwise you're always going to look hideous in that mirror you're never going to want to use it also are you a person who wants to have a bidet one day and if you are you're going to want a power source by the toilet do you like heated floors or do you want a towel warmer on the wall all of that needs to be planned right now do you plan on having a backlit mirror so that you can do your makeup consider that when you're figuring out where to put your electrical number six the kitchen your Island should always have Outlets think about pendants over your Island as well as sconces if you're doing any open shelving and if you're investing in a really nice backsplash or even if you just don't want to see outlets in your backsplash consider doing Outlets underneath your cabinets or inside of your cabinets under cabinet lighting is something that a lot of people love so consider having that installed and don't forget to have a drawer with Outlets so that you can have a charging station in your kitchen that is always a plus and people love that Outlets inside of your cabinets so that you can hide a toaster or a coffee maker in there that has been very useful for me and I love having that also consider having an additional Outlet under the sink just in case you decide to do an air switch for your garbage disposal or potentially add a hot water tank if you end up doing an outlet in your backsplash I think it's a really good idea to inset that outlet so if you're planning to put a small appliance in front of it like a coffee maker you can push that coffee maker right up against the wall so that it's flush as opposed to sticking out by the size of the the cord that will actually give you some more counter space also think through your pantry do you plan to use small appliances in there so if that's the case you're going to want to add some additional Outlets as well number seven General needs are you planning to have a security system or do home automations if so you may want to consider where you want to have your panels installed think about your Outlets some Builders give you options on having your Outlets installed vertically horizontally and sometimes even in the trim work so that it kind of camouflages it so that's something to think about as well also give some consideration to your light switches think about the lights that you want on dedicated switches or what lights can be grouped together all on one switch also think about where you want those light switches placed so that it's easily accessed I remember in my first custom home that I built I was very young and I had the switch installed behind the powder room door for some reason I'm not even sure why the Builder let me do that but I guess I wasn't considering the swing of the door I assumed that it would swing this way and it ended up swinging this way so for the rest of the time that I was in that house I'd always have to go into this powder room close the door and then feel around in darkness until I found the switch so now that's something I always look at when I'm building a house I make sure that I I figure out which way the door is going to swing and that I can easily access the switch from outside of the room also think about wall sconces you can add wall sconces everywhere just to highlight different parts of your house and make it very interesting remember that you don't have to buy the light fixtures from the Builder in order to get the wiring done because they can just put the wiring there and then cap it off which makes it really easy for you to install a light later on down the road when you find the perfect one for that spot also if you're into art think about picture lights I think those are very Charming think about dimmer switches also are you planning to have electric blinds you'll need some power for that how about your staircase I've seen it recently where people are adding lighting to the Treads which looks really cool but if that's you know too expensive you can also have it going up the staircase and that looks really nice as well one last tip once all the electrical is wired before the drywall is hung it's always a good idea to take pictures and video of everything so that you know where the wires are and the plumbing is located behind the wall because once the drywall is up you're not going to remember where everything is so later on when you go to make a hole in the wall or put an inset or add some shelving you know what's behind that wall and you don't do anything to disturb the wires or the pipes well that's everything I could think of as far as what I've encountered and learned from my past experiences Building Homes but please if I've forgotten anything or if you think of something that could be beneficial for our listeners please go ahead and leave it in the comments and I will make sure to include it in one of my upcoming videos I really hope that this video was helpful for you and that it kind of gave you some insight as to what to expect and what things to prepare for and think through before you attend your electrical walkthrough this is going to be part of a video series taking you through step by step of the new construction process so if you're in the process of building a house or even thinking about it please go ahead and subscribe to this channel so that you don't miss any of my upcoming videos and of course if you are interested in moving to Atlanta or interested in buying building or selling a house in the Atlanta metro area please do not hesitate to reach out to me my name is Tanya Cristiano and I am a local realtor I specialize in relocation and new construction and I would love to help you find or build your dream home well that's a wrap for the electrical walkthrough till next time bye now foreign"

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"VideoID": "17",

"Title": "Electrical Rough-In Inspection (New Construction)",

"URL": "https://www.youtube.com/watch?v=wDLa\_A7wGrQ",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Music] [Music] oh [Music] all right we are back again with another video let's just get into it um today we're going to talk about uh what i look for when i am doing an electrical rough the areas that i look for are the violations i look for when i'm doing an electrical rough um so let me just get this camera turned around we'll get started um we're in a brand new home just it's built it's a small one it's probably about 1200 square feet it's a single single family one level and i'm kind of giving you uh give you a look um so let's just go through um try to make this quick i want to try to keep them short and sweet um i seem to get more views when they're when they're short so i'm gonna try to keep them short uh electrical rough um so let's get into it this is a bedroom here uh pretty much go through and check all the at least one outlet on every wall every wall and it is secured to a stud and the romex is going straight up through the top plate and if it's closer than an inch inch and a half to that edge into that top plate then we need a nail guard or some some type of metal plate i'm also wanting to seal the penetrations but typically i'll check that on on framing or or insulation but i go through each bedroom make sure there is a smoke alarm box in every bedroom as well i also look for if they're coming off that receptacle box that within a foot within 12 inches that it's secured you want to make sure that that every box is you know every row mix every wire is at least secure within 12 inches you got your switches going through switches right here that's a switch box right here and within that 12 inch area you want a staple down here in georgia we are under the nec 17 where we just transitioned to the nec 20 but when this house was permanent which was late last year um the electrical we were on the nac 17 so a lot of the codes that he is is governed by is is under you know last year's code we just transitioned to a new electrical code this year nec20 but the number of wire or nec or romex going through every hole the max is is for four of these i typically cap them at three i don't i don't want any more than three going through so i go through and check every penetration make sure no more than three are going through every every penetration like i said i go through this is the family room area here goes through and check every wall make sure there's at least one outlet okay now we're in the uh the kitchen area this is a smaller house i'll say again maybe about 11 1200 feet this is the kitchen area it's really really small um and this this is the kitchen sink here you see the drainage line hot and cold water and there's another the red is the hot water blue is a cold got hot and cold water for this thing and we got another hot water for the dishwasher that outlet here receptacle boxes for the dishwasher as well or it could be for the garbage disposal but this will this would be pretty much where the kitchen sink will sit we want a outlet within two feet each side of the kitchen sink so we got one here outlet we got one on the other side as well check for that come over here to the laundry make sure we have an outlet for the washing machine and for the dryer so i i go through every room basically check make sure that you know we got outlets on every wall we got smoke alarm box in every bedroom smoke alarm box outside the bedroom smoke alarm um on every level um make sure you have receptacle boxes for those those units also in the attic this particular house it does have an attic in it i don't know if you can see it that's the attic opening right here and there is a unit up in that attic i'll try to get you up there to see there doesn't mean it hold on for a second get you up there and there is a unit as you can see there's a unit up in the attic right there so also make sure that there is a service outlet up in the attic wherever that unit is and there's a light fixture a box or a light fixture up in that attic as well if if there were no mechanical units if they didn't have a furnace up in that in that area then that would not be needed maybe just a light fixture but that's not even required if there's no mechanical unit up in that area in that attic area then there's no light fixture there's no surface outlet required up in that area but this particular home has a a air handler up and at it like a lot of homes in georgia like a lot of home down here in georgia they do we require them to have a light fixture a box for fixture light fixture and a service outlet now also check the panel as well this is the panel it's a 200 amp panel as you can see make sure that the neutrals neutral neutral line is a neutral line right here that the neutrals and the grounds the grounds over here they're separate they're they're on their separate separate bar so the nutribar here the ground on this side electrician did a nice job of setting separating everything um [Music] make sure these lines are really tight and secure with torque down correctly um that's the line that's coming in from down in the crawl spaces this house does have a crawl space it goes that that service line runs down below the bottom plate through the crawl space out to the meter base i also check to make sure there's a bulker plate that's the metal plate i'm kicking it with my shoe um he drilled a nice little hole so they have to go back and seal all those those penetrations up but i want to make sure there's a there's a plate there in case you know when those guys come through with that nail gun and that drywall that they don't they don't hit that that service line right there um and and the uh the romance going up through the top plate all right you see the holes that are drilled they still have to come back like i said let me flip this around still come back and seal all these penetrations up you got your bokeh plate that's that big metal plate that keeps uh you know keep the guys from from hitting that wire away installing the drywall and that still had to be sealed um but those are kind of things i checked um like i said i'm trying to keep it short um check the penetrations through the top bottom plate make sure the house it does have boxes for alarms smoke alarms carbon monoxide detectors um check the location of the panel make sure all the penetrations are sealed and not real close to the edge if they are we need some kind of guard some kind of protection and that's basically it um i'm trying to think of uh also on the exterior um i go outside to make sure that there's a service outlet for the condenser make sure there's exterior outlets front and back um the romex going out for light fixtures at the doors front and back um and outlets front and back uh any other light fixtures maybe on the corners of the house they could have some like this is one right here and show you one one real fast he threw one up right there that's for the corner for like a spotlight foot floodlight that's basically it basically this is a small house here like i said it's about about 11 1200 square feet that's what i kind of look for when i'm doing an electrical rough hope you guys enjoyed this um [Music] got any questions like i said hit me up down below i will get back with you as soon as humanly possible and i hope you guys stand safe man keep the mask on and and uh we'll see you soon man we'll see on the next one you"

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"VideoID": "18",

"Title": "5 CLEVER Electrical Tricks Everyone Should Know",

"URL": "https://www.youtube.com/watch?v=9hlo87E\_GdQ",

"Keyword": "Electrical construction techniques",

"Transcript": "here are five clever electrical tips including why \ni think you won't mind giving up these tip number   five there is a way better alternative out there \nto using these tip number five is to stop using   marettes so these things basically have a little \nmetal housing on the inside and these are used   to try to connect your wires and the fact is you \njust don't know if it's actually making a positive   connection or not so the replacement that is \nso much easier to use and so much better is   these guys these are called lever nuts so you \ncan take a couple of wires like this and let's   grab one of these that does two and if you look \nup close here inside there's a couple of inserts   and when you close one of these you can see that \nthat metal inside there where it's pinching down   and making a positive connection so as i \nfeed my two wires in here just feed them   both in like that push down the lever and then \nwith that i've got a nice positive connection   i can visibly see that the levers are engaged \nso there's no issues there another great thing   about these is even if you've got a situation \nwhere you've got several wires here i've got   five different ones and i've even got one that's a \nmuch heavier gauge than these 14 gauge wires here   i can still feed all of them in make sure they're \nall pushed in lock down the levers and then i can   use these five and if i need to change something \nout let's say i need to replace the source for   this one i can pull that one out and then \nput a different one in later slide that in   lock it down it's in there snug and i'm good to \ngo now these kits are pretty inexpensive they're   usually around 20 bucks and the nice thing is they \nhave all different kinds of connectors there's   lots of pieces in here and you have that peace \nof mind of knowing that everything is connected   exactly the way it should be and there's no \nguesswork involved tip number four when you need   to splice wires together twisting them is not the \nanswer if you're trying to fix a wire that's been   cut like this one start by stripping the wires \nabout an inch and a half or four centimeters deep   exposing the wires inside twist each set of wires \nuntil it resembles one solid wire slide some heat   shrink tubing over one side and we'll come back \nto this toward the end of this step starting with   one of the wires create a hook where the rest of \nthe wire follows parallel to the existing wire   and then bend over the end at 90 degrees like this \nnow repeat that on the other wire line it up like   you see here and then once you've got the open \nends going through the loops of the opposite piece   then grab those open ends and pull tight you \ncan see it creates a perfect little knot here   and as you pull apart it's just going to tighten \nthat knot making a stronger and stronger bond if   you need to you can snip off any excess wires \nthat are hanging out over the insulated area   slide over the heat shrink tubing and \nthen melt it a little bit with a lighter   the two wires have now become one again they're \nsealed and protected with a good contact signal   and they're not going anywhere this is a super \nstrong bond now you can give those a good pull   and they're not going to come loose no matter \nwhat tip number three there's no need to replace   an entire cord if just the plug or end has gone \nbad we've all seen this before where your cord   seems to break in exactly the wrong spot right \nup near the plug fortunately there's a pretty   easy solution to this to start you'll need to \ncut the cord where you can get a nice clean end   looking inside we can see that we've got three \nwires here we need to expose the three inner wires   so to do this we'll use a sharp blade and make \na small cut or incision at the end of the cord   we can then peel it open and then pull \nthose wires back to get as much as we need   in this case a couple of inches will do just \nfine cut off the excess and then strip about   a half inch of wire on each one we can now get \nrid of the old plug and we're going to replace   that with a standard three-prong replacement plug \njust like the old one this one has a ground a hot   and a neutral you can just pull the top right \noff and then feed the wires in through the back   the colors of the wires inside the cord that \nyou're fixing may vary in color sometimes they   might actually be black white and green just like \nyou'd find in an outlet but more often than not   they're using other colors in this case the brown \nthe blue and the green are pretty traditional and   the brown represents the hot or the line the blue \nrepresents the neutral and the green is ground   the colors of the screws inside the replacement \nplug are typically going to be brass   silver and green green is always ground brass is \nalways hot and silver is always neutral loosen   each of the three screws and then feed the wires \nin and tighten them for a good secure connection   if you need to feel free to trim any excess \nwire so there's no extra wire hanging out   with the wire securely in place you \ncan put the top of the plug back in   and then use the three coarse \nthreaded screws to fasten it in place   the last step is to tighten the clamp on the back \nthere are two screws to fasten there and once   you've got those tightened down that plug is nice \nand secure not going anywhere and as good as new   now these replacement plugs come in both the three \nprong and the two prong or non-grounded variety   and they usually cost just about two to five \ndollars at the hardware store i'll put some   links in the description below in case you want to \npick one of those up online tip number two is to   always work with the grain when you're working \nwith screw terminals you've probably heard the   term righty tighty lefty loosey what some people \nget confused by is the fact that that refers to   the top of the rotation so on a screw like this \nfor example on this light switch when you turn   the screw clockwise the top of the screw turns to \nthe right and that's where the righty tighty lefty   loosey comes into play when you're using a hook \nlike this ideally you always want the open end of   that hook to be towards the right if you line your \nhook up backwards like i've got here where the   opening is on the left then what can happen is as \nyou tighten it's going to try to open up that hook   and it could slide it right out from underneath \nthe head of the screw the more you tighten   the more likely it is to push it right out i'm \ntightening this one down for example until it's   nice and snug and when it feels like it's all the \nway tight and everything's got a good connection   you can see that it's actually popped right \nout the sides and i can just pull it away   if on the other hand i choose to go with the grain \nby putting the opening on the right side then as   i tighten that down both the screw and the plate \nunderneath it are going to tend to close that hook   and that's going to create better contact and \na better electrical bond between the wire and   the terminal for this demonstration i used a \npretty loose hook just to show you what could   happen but if you use a tighter hook you're going \nto have better results no matter what in fact you   can see there's a little ledge or a little drop \noff so that it tends to hold that hook or that   wire captive inside there so these are really \ndesigned to work as best as possible even if you   do it wrong but by doing it right you're going to \nget better contact and a better signal every time   this same tip applies even more \nso to stranded wires like this one   if you place the wire in the wrong \norientation or against the grain   as you tighten the screw it will tend to push \nall of those little strands out and away from   the screw itself making an even poorer connection \nwhen you place it with the grain it's going to   tend to pull those wires along with the tightening \nof the screw and make a much better connection   better yet tighten up those threads as much as \nyou can by twisting them into one solid piece   wrap it around with the grain tighten it and \nyou'll get a much better connection overall   if you do have to connect a stranded wire like \nthis to a screw terminal one of the best ways   is to use a u-type or a fork connector with the \nstranded wire and then just insert that under   the screw and as promised tip number one is why \ni don't think you'll mind giving up these wire   clippers have been around for a very long time \none of the trickiest things about them however   is knowing what size wire you're trying to strip \noftentimes you just don't know and that requires   a bit of guesswork to try to try one and then \nthe other and see what works and what doesn't   just a few years back i got my first set of these \nnew style universal wire strippers and these are   pretty awesome for a host of reasons the way these \nwork is very simple basically it's got some jaws   and it's going to grab both the right side and \nthe left side and it will pull the right side   away from the left side it will either remove \nthat sheathing altogether or at least separate   it enough that it's easy to pull off yourself \nthe crazy thing is this works on any size wire   i can do this on 20 gauge or 18 gauge like \ni've got here i can do it on 14 gauge wire   and still not having touched a thing i can \ndo this on even 10 gauge or even 8 gauge wire   it doesn't care and it doesn't matter what size \nwire i'm putting in there now those were all solid   wire but you can see that this actually works \njust fine with stranded wire as well the best   part is it doesn't actually cut into the wires \nthemselves a lot of times when you're using a   sharp blade and you're trying to cut it precisely \nyou end up cutting some of the wires and that   weakens the signal and gives you less area to make \ncontact with so whether it's a thicker stranded   wire like we just did or even a really thin and \ndelicate one like this it can handle it no problem   and if you look close up here you can see that \nall of the wires are intact nothing is missing   universal wire strippers typically tend to \ncome with all of the features that you see   on traditional wire strippers like crimpers in \nthe handle and a wire cutter now there's one other   huge feature that these universal wire strippers \nhave that traditional wire strippers can't touch   and that is they can tear the sheathing really \neasily off of complex wires let's take a look for   example at this ethernet wire typically to open \nthis up you're going to have to make a little   slit somewhere and then pull that sheathing back \nbut with these universal wire strippers place them   in there anywhere you want and it will just break \nthat right off piece of cake this also works super   well on multi-wire cables like romex here's some \n14 2 cable for example that it handles no problem   it even works on 14 3 which is wider than the \njaws themselves but as you can see i can grab   onto it pull it apart and then i can either yank \nthe rest of that off or just flip it around and   cut that as well remember earlier when we were \ntrying to replace that plug on that power cord   well those little three cables that are in \nthere are pretty delicate and we don't want   to cut into those so rather than snipping the \nend and then pulling the sheathing back you can   just use some universal wire strippers and it will \npull that outside sheathing off without a problem   then without touching a thing you can \nalso strip the three small wires inside   as you can see here this is rated for 10 to 24 \ngauge wire but i found that you can go lower   than that and higher than that and this thing can \nhandle just about anything without any problem   if you are working with finer wires there \nis this little knob here that you can twist   to adjust the delicacy or the pressure with which \nit actually pulls those apart these wire strippers   also have a depth stop built in so if for example \nyou want to take off a half inch off of a whole   bunch of wires you can just set your depth stop to \na half inch push each wire up against it squeeze   the trigger and you'll get consistent results on \nevery wire now hold on we're not done just yet   there's actually seven more things i want to show \nyou hopefully you found some cool stuff in there   but what about painters tape i've got seven \nclever tips for painters tape that you can   check out right here and i'm pretty sure you're \ngonna learn something new in there by the way none   of them involve painting as it turns out so go \nahead and click on that tap on that do your thing"

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{

"VideoID": "20",

"Title": "5 tips on how to get the perfect electrical rough-in! #frenchtouchconstruction #construction",

"URL": "https://www.youtube.com/watch?v=sXJrB9VswhY",

"Keyword": "Electrical construction techniques",

"Transcript": "I wanted to share five tips with you for the roughing electrical that may help you to mitigate some of the issues down the road first tip guys make a loop before you go in the box with your wire so now the Box can be moved left right up and down that gives you options to change locations number two guys if you have any steel plate on the stud and there's a backsplash with tile get them recessed so now with the subway tile it's going to be flat and you won't have that line off tip number three get your adjustable boxes if you have a tie in the back that will help you tip number four get all your boxes online with a laser it's very quick and if you have subway tile or such a thing they'll be all perfect aligned with the subway tile tip Number Five Guys identify all of the wires in the boxes so when the customer to walk through they can know what's the box maybe it's a plug maybe it's a switch maybe it's for the oven maybe it's for the garbage disposal I really didn't know what they are expecting thank you Optical Beach"

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"VideoID": "22",

"Title": "How To Install Electrical Boxes Into Concrete Walls !! Simple Techniques (DIY)",

"URL": "https://www.youtube.com/watch?v=sh5M9pkMwf8",

"Keyword": "Electrical construction techniques",

"Transcript": "hey what's going on guys welcome to another video from electrical installation Triple E where we're going to just do um a simple technique also something t as well where we're going to install some um on box right here but I want to do some simple techniques where we show you how we actually do this um first thing first we have this cut out right here so the space is right so one of the thing that we going to do is we going to use a straighted board you can see the straight is right here so we're going to use a straight board right [Music] the purpose of the board is actually to hold the Box firmly for time consuming so we can move on to do other think instead of to do we're going to use so the doesn't get away from right right here [Music] so for [Music] than [Music] [Music] as you can see guys get right here to right here and this hold so we can go on and do other things so this is for time consuming for for oh oh e e [Applause] n [Music] so guys this is the end result um for when you put in two boxes or three multiple boxes um um in the same line This is how you get it accurate right here we also have it one two right here yeah yeah and if you notice guys we stuff the box with papers so in case when time the me going to finish their rendering or so for um no Mar anything get into our pipes and block up our pipes so that's why we stuff with the papers yes thanks for watching another video from electrical installation Triple E guys hopefully you guys learn something again new just some simple techniques we doing right now um continue to support the channel the channel is growing and I appreciate you guys for your support and support and like my videos and also share my videos also comments I know they always coming in and I always respond to them so thank you guys for watching another T World video or simple techniques from electrical installation CH until next time guys stay safe"

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"VideoID": "23",

"Title": "Electrical Techniques",

"URL": "https://www.youtube.com/watch?v=jiqF2pzCli0",

"Keyword": "Electrical construction techniques",

"Transcript": "I've been around electrical most of my life and it's something I've been involved with but I never got directly into so I decided to take a take a shot at it well this program if you're looking forward to get into the trades it gives you a start at the fundamentals where it covers a wide variety of elements inside the trades such as a conductors different wire sizes konbu boxes different components we use in the trade so in actual fact if you're gonna start an apprenticeship you'd be further had to take this course first and it gives you lots of experience to start off the apprenticeship the difference between electrical technician and electrical techniques program is the focus the main focus the main focus with electrical techniques is to create that stepping stone to walk into electricians job and be able to start and have a base knowledge of what you need to be doing what the tools are what the equipment is they focus more on the actual doing of the tasks they're actually in there and they are creating those circuits building those circuits and their main focus is just simply on the wiring and how to get it done I chose st. Clare College for this program because I had attended here before dad really great staff and the the programs were designed to be more personal and they're pretty much one-on-one you get a lot of good information the student will learn the different tools and how to use the tools they learn about the different components inside the trades such as the actual material we keep in the stockroom proper metering they learn how to use a multimeter different testers the faculty here are experienced professionals previous electricians from the industry different fields from computers electronics to electricians to to wherever it's anything electrical involved there they're really knowledgeable when the student finishes is it'll be certified it has a starting point for a first-year apprentice inside the trade itself so for the electrical techniques the career path is to become an electrician or electricians aid work in construction and also be able to sell and service electrical parts Sinclair College has been great it's it's got friendly staff the student services are fantastic the library services are amazing the the students that I'm working with are great people they're trying to make a difference in the trade and and we're all working very hard"

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"VideoID": "24",

"Title": "Dan talks about the Electrician – Construction and Maintenance Apprenticeship Program",

"URL": "https://www.youtube.com/watch?v=gDl0Ouq\_p0E",

"Keyword": "Electrical construction techniques",

"Transcript": "(upbeat music) - Hi, I'm Dan Burkholder, and I'm just starting my third year as an electrical apprentice. I chose this trade because I wanted a promising\ncareer where I could feel like I was accomplishing\nsomething every day. A highlight of my apprenticeship has been trade school at Conestoga. I'm a very hands on learner, and when I was in high school I struggled because I didn't see a\npurpose for the things that I was learning. But in apprenticeship, I learn on the job. And then when I go to school, I learn the things that are\nactually relevant to what I do. One of my favorite moments of work is when we're finishing a house and we're starting to turn the lights on, one by one they're coming on. That moment just makes\nmy heart skip a beat and puts a smile on my face every time. My career goal is to one day become a teacher and I\nwant to train apprentices. Maybe you like working with your hands or maybe you want a great paying job that's always going to be in demand. Maybe you're the kind of\nperson that likes the idea of having the option to\nwork in a variety of fields, whether it be construction or maintenance, or could be residential or commercial, industrial or agricultural, maybe you should be an electrician. (upbeat music)."

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"VideoID": "25",

"Title": "wall cutting style | electrical underground pipe fitting work #electricalelectricianwireman",

"URL": "https://www.youtube.com/watch?v=xaEM5m\_Xqjk",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Music] thank you [Music]"

},

{

"VideoID": "27",

"Title": "How to Trim Out Electrical on New Construction | Building A $350,000 Custom House | Episode 47",

"URL": "https://www.youtube.com/watch?v=AEAMolwoGwg",

"Keyword": "Electrical construction techniques",

"Transcript": "very exciting day today the electricians are on the way [Music] oh that was clean [Music] any kind of car that needs this 220 anyways look how beautiful this is right here [Music] top of the morning to you folks and welcome back to nico's property show very exciting day today the birds are chirping it's a beautiful day the sun is shining and the electricians are on the way they are going to start the trim out for can lights for vanity lights you name it chandeliers whatever i have they are going to start trimming it out it's exciting the fans in the bedrooms this thing this house is about to finally become that home that i've been waiting on for literally what six seven months now i'm so excited this is a very exciting point in the build because now you see all that hard work really come to fruition and you're finally seeing this house become a home instead of just a construction job site but anyways that's enough talking for me they're about to pull up and when they do of course you'll see that but anyways let's get them once they get here [Music] oh [Music] [Applause] [Music] [Music] wow [Music] already all so the electricians are here and as you can see there's huge amounts of boxes here and we've got the fans we've got the can lights and you see i went with the four inch square led ultra thin these are going gonna look amazing in the house about all kinds of stuff here for my master bathroom master bedroom this i don't even know where this goes to be honest with you but it's gonna look amazing got more fans literally just boxes on boxes on boxes got my man in there working right now this is going to be phenomenal adrian always comes through with the squad and they are killing it right now they've got all the outlets going in and i've got some usb outlets i'm going to be using in some of the rooms in my office and then against the beds and everything like that but they're about knocking these out getting the light switches knocked out as well so i'm gonna go in one of these bedrooms and actually show you what i am talking about if you look in here the outsides of where the bed is gonna be i'm gonna have usb plugs so that if you have a phone that you just want to plug your charger in um it's going to be kind of like a smart house not too smart because we ain't spending all kinds of money but it's going to be smart enough so anyways during there working i'm excited very happy with the progress we're going to get this thing rolling so let me go film them some more [Music] [Music] [Applause] so [Music] [Music] wow [Music] [Applause] [Music] already also as you can see this is that four inch square can light that i have and that's the box where he's connecting all the wires to and once he's done all you have to do is pop it in and it holds on with some clips and when he's done with all of the lights he'll put a laser on it to make sure they're all nice and straight everybody else is working throughout the house getting all the light switches and all the outlets set where they should be and again i told y'all we'll be setting some usb ones throughout the house but he has to actually cut those little circles out throughout the entire house and then they've got the speaker in there his dad's working hard and everybody's just doing their part but all the light fixtures are getting set and i'm very excited for more progress to come [Applause] [Music] [Music] so [Applause] [Music] [Applause] [Music] [Applause] [Music] [Music] [Music] so [Music] [Music] [Music] alrighty also as you saw throughout the video right there we actually got this entire trench dug while i did it with the excavator the mini x and um now that epb came in they dropped the big wire for us now my electrician can actually get my electrical panel hooked up get that breaker box on the outside of my house done and everything's going to be good for temporary power so we're going to get all that done and i kind of wanted to show you right here as you can see they got that running down and then you go through here and you look through the trench they've got that entire super big cable all the way to the side of the house and my electrician's gonna get that set up right there so i'm very excited for this part of the process because that means i'll be able to have a couple lights going on in the house i can get my hvac set up so we can get some air circulating and this is a very good part of the process because it tells you you're getting close to finally being able to live in your home so anyways let's get him installing this panel and everything and getting this breaker box hooked up and getting how all this is gonna work out so let's do it [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Music] [Applause] mhm [Music] [Applause] [Music] alrighty also the electrician is completely done setting this for me right here and it looks really darn good they got everything connected to the ground rod that's going over there i'll be able to cover this entire trench up clean this area up and then finally be able to get into this sewer area um and then where my water line is actually going to come out and get all that connected in and we are going to keep progressing this is amazing a lot of progress being done glad i could get these utilities dug out glad i could get uh the electric you know progressing this is very exciting stuff i mean it gets me closer to finally being able to move in but anyways i'm gonna head inside see what they're doing in there and we're just gonna keep moving [Applause] [Music] [Music] [Music] [Music] so [Music] alrighty also i wanted to give y'all an awesome walkthrough of basically all the electrical trim out okay so that that final like putting the fans up and getting all the outlets in and everything like that because once the painters are able to paint the house this is all going to be finalized but right now there's a lot going on but i just want to show you since we were doing you know the electricians being here with everything like that these fans that i have throughout the house are amazing i love how the fans turned out love how these actual lights which are can lights right there but they just clip in they're not the traditional ones you're probably used to seeing and then if we go into this bedroom right here you can see this fan right here looks absolutely amazing as well and then the back porch will actually get one and then basically all the rooms have them so a lot going on this is going to be kind of flip-flopping throughout the videos just because there's a lot of people doing work but again going into my master bedroom love how this fan is my interior designer is choosing all of these different things of course got the square four inch can lights throughout everywhere so as you can see right here i mean it just it just looks beautiful i absolutely love it and i'm excited with everything that's going on so if you've not been following along if you haven't seen all these different things i actually want to take you into the garage and show you something that i think is really really important um i actually have a 220 volt for any you know future you could say like electric cars or anything like that so basically right here let me kind of step over this so you can see you could connect a tesla or basically any kind of car that needs this 220 and you know right now this may cost you what 50 to run but in the future if you didn't have this that'd be like a thousand dollar thing to do because then you got to cut into the sheetrock you got to call different guys everybody's got to fix everything so anyways look how beautiful this is right here got my electrical panel done by the electrician he did a phenomenal job got the outside meter box area set up we just got to get the um you know my local epb provider to come set it but this looks beautiful um got this for the actual i'm not even gonna open that for the water heater and there's a lot of progress happening in the house that i'm really happy with and i'm just excited to finally be able to move in here be able to use this place as my home and start making memories but like i said i'm jumping in and out of different things um got outlets in certain places oh that's something i wanted to touch on i've got these kind of outlets where you can see like i got the usb connections and then in certain areas around the beds i even have like the usbc you can see right here you've got that i've got those in my office and then i'll even take you into the the water closet where like you literally use the bathroom right here so we even got charger access right there as well so i'm very very very happy with everything going on i'm really happy that the electricians were able to come out knock this out i wanted to go through this entire process with you and just show you how beautifully the house is coming together but i think it is time to end out this video so let's do it alrighty y'all so i hope you enjoyed this video where the electricians came out they basically trimmed out the whole house few little finishing touches of course they're gonna put caps on but you'll see that in videos coming up where they're putting caps around the outlets and all these different things i'm very happy with the progress but regardless if you did enjoy this video make sure you like and subscribe and make sure you follow me on all social platforms especially tick tock because it's so easy to film edit and post on there and if you haven't yet check out niko'spropertyshow.com maybe grab you a hat a hoodie a t-shirt and use codeniko for 10 off your entire order without further ado smile more worry less and stay blessed i'll see you in the next video peace you"

},

{

"VideoID": "28",

"Title": "Installing wires in electrical panel. #electrician #construction #trades",

"URL": "https://www.youtube.com/watch?v=LdNuJksviTY",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign [Music]"

},

{

"VideoID": "29",

"Title": "Modern Construction Technology: The Future of Building ▶7",

"URL": "https://www.youtube.com/watch?v=5HLFjjZ\_Bp0",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign [Music] foreign [Music] foreign [Music] [Music] thank you [Music] thank you thank you [Music] [Applause] thank you foreign [Music] [Music] thank you [Music] foreign [Music] foreign [Music] [Music] thank you [Music] thank you [Music] foreign [Music] [Music] foreign [Music] [Music] thank you [Music] thank you [Music] foreign [Music] thank you [Music] thank you [Music] [Music] [Music] thank you thank you [Music] on the day [Music] foreign [Music] [Music] thank you [Music] foreign [Music] thank you [Music] [Applause] [Music]"

},

{

"VideoID": "30",

"Title": "How To Freeze Electric Gates #electrician #electrical #construction #diy #repair",

"URL": "https://www.youtube.com/watch?v=HE-zuWGkssU",

"Keyword": "Electrical construction techniques",

"Transcript": "so if you want to prevent the gates opening and closing just grab a tape and put it across the sensor like this so it will think there is something on the way and then you can operate the gate and just take the sticker off"

},

{

"VideoID": "31",

"Title": "Can men do basic electrical repairs at home by themselves?#construction #electrician",

"URL": "https://www.youtube.com/watch?v=hf4zpz9z7hs",

"Keyword": "Electrical construction techniques",

"Transcript": "I have a small question can someone explain it to me in the USA to become a journeyman electrician you need 4,000 hours of on-site working experience and 2,000 hours of in school training so for basic home repairs you have to call a professional electrician to fix them and pay them I don't know whether men who are not trained in electricity know how to do basic electrical repairs such as adding an outlet fixing damaged wiring or if they can do it but are afraid to do it because they don't have the qualifications and are limited by certain regulations"

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{

"VideoID": "33",

"Title": "How to Draw an Electrical Plan With RoomSketcher",

"URL": "https://www.youtube.com/watch?v=zeL\_0NUboZ8",

"Keyword": "Electrical construction techniques",

"Transcript": "With RoomSketcher, it’s easy to create \nelectrical plans, also known as wiring diagrams. But first, what exactly is an Electrical Plan? An electrical plan is a diagram \nthat shows the placement of outlets,   switches, and electrical fixtures. It serves as a guide for electricians \nand contractors during installation.   Use an electrical drawing software like \nRoomSketcher to create your wiring diagram. So let’s learn how to draft an electrical \nplan using the RoomSketcher App. With RoomSketcher, you can either order a \nfloor plan from our expert illustrators,   you can upload an existing \nfloor plan to trace over, or you can draw a floor plan from scratch. If you are drawing from scratch, start \nwith the walls, then add doors and windows,   and make sure to add key fixed installations. When the basic floor plan is complete, drag \nand drop electrical symbols onto the layout,   including lighting fixtures, \nswitches, and outlets. RoomSketcher lets you customize each \nelement's size, placement, and orientation. It’s a good idea to add labels and \nnotes for further clarification. And that’s it! Your 2D Floor Plan \ncomplete with all your electrical symbols. So go ahead and start creating \nyour electrical plan today!"

},

{

"VideoID": "34",

"Title": "Electrical Panel Or Artwork? #tutorial",

"URL": "https://www.youtube.com/watch?v=7n\_ebDw5thE",

"Keyword": "Electrical construction techniques",

"Transcript": "other daily tip so there's a couple ways to look at this video the first way is gosh this person takes pride in their work and I can respect that and then the other way to look at it is gash a couple hundred bucks an hour and that's how they're spending their time this is only ever going to be seen by the electrician or the inspector is it worth it is this just some sort of an attention grab for electricians because their work is never actually seen it's just expected to work just a thought"

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{

"VideoID": "35",

"Title": "Powering a 120v pool follow for tips and tricks #electrician #electrical #construction #america",

"URL": "https://www.youtube.com/watch?v=g0wLPO54N3E",

"Keyword": "Electrical construction techniques",

"Transcript": "uh who' you say did the electrical work oh that would be my nephew Thomas he's very handy uh what year did his House burn down about 2 years ago how do you know his house burned down had a feeling oh you at that"

},

{

"VideoID": "36",

"Title": "Industry Fast Track: Electrical Construction Technology",

"URL": "https://www.youtube.com/watch?v=qDBX5r8w\_Hk",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] my name is travis zarnoff i'm the electrical instructor for johnson college if you can look over here we're pretty much doing all residential uh installations um between you know working inside of a panel to you know all the brand circuits you see in a normal in a normal home these are a mixed collection of high school students and you know older students even some in even into their 40s so it's a good mix i'm wiring up the panel which is going to give power to what conor is wiring up which is the thermostat and that's going to control the baseboard which will supply heat to whatever we're supplying to like a house or something like that so the wire the thermostat i have to make a pigtail which is connecting a wire to two other wires that way it'll make flow on the same current personally i just love watching them watching the light bulb go off literally i think that i i actually just enjoy watching everyone learn everyone learns on a different level and just i just like to be able to be be able to have a hand in that i guess the biggest takeaway from just this program alone is being a little more self-sufficient i mean even if you don't come out of here you know doing electrical you have a huge leg up knowing how to work a lot of power tools you have a basic basic knowledge it's just a huge personal gain even if you're not committed to going into the field so our job placement is up to 100 depending on the program our specific trade programs like our electrical carpentry hvac those uh there's incredibly high demand not only within the country but very much in this area so as far as students getting jobs if you talk to anybody in our career services department they'll tell you there's not enough students coming through to fill the jobs that they're being offered so we send emails to all students and families about these programs the best place to find out about it was check your email but also go to the career exploration and readiness tile in edio so the steps are you go to edio you click on community click on news type career and you'll see a tile that looks like a scrabble board and in that tile information about all these programs career consultations podcasts and videos uh maybe a minute and a half two minute videos about these programs it doesn't hurt to try it but you got nothing to lose it's a positive environment so if anybody wants to come here i recommend it i've had good experience"

},

{

"VideoID": "37",

"Title": "Electrical Contractors: Things You Need to Know",

"URL": "https://www.youtube.com/watch?v=7rtP7\_TM6io",

"Keyword": "Electrical construction techniques",

"Transcript": "today let's talk about electrical \ncontracting businesses and starting   your own electrical contracting business [Music]   so something that y'all are probably going \nto start seeing me do more often uh on this   channel and my journey to master Channel which I'm \nstarting to record more content tons of you been   asking for that I have a whole project that I'm \nstarting that up I won't get into now but you're   going to start hearing a lot more business level \ncontent from me so I figured this would be a good   opportunity to just start talking about some of \nthe things that I think a small startup electrical   contracting company should consider so here are \nsome things my suggestions of ways that you should   handle being a brand new company number one work \nfor yourself and buy yourself for a little while   so when you get a new company started up it's \nkind of hard to make the phones ring you got   to figure out whose doors to knock on where \nto put yourself what kind of reviews you need   where you need to like go and do stuff to get the \nphones to ring there's a whole bunch of different   methods to doing this and I think you should do \nthem all but if you're working by yourself you   are an income earner the worst thing you can do is \nhire an apprentice right away because now you have   double the amount of salaries for still the same \nincome so you're just going to be running yourself   ragged for a really long time if you start with \nan apprentice even if you start with another   journeyman you need to have enough money set \naside that you can pay them and so I think just   working by yourself maybe the first year maybe the \nfirst three months six months whatever until you   can save up some money and make sure that you can \nreally afford to hire somebody number two is keep   a balance in your bank account I like to keep no \nless than ten thousand dollars so when I see ten   thousand dollars in my business bank account ten \nthousand dollars means zero it means I'm broke and   if you think of your bank account like that don't \nsee 10 grand and be like I'm rich and I got all   this money your bank account is gonna go like this \nconstantly you might have 10 grand in there and   all of a sudden you got to go buy five thousand \ndollars of materials to go rough in a house or   something now you only got five grand in there \nwhat happens if you have three more jobs you got   to buy materials before you get paid then you're \nlike down to three thousand and now you don't have   any money that's gonna happen often so I like to \ntreat ten thousand as my zero and just make sure I   got 10 grand in there and then anything above that \nis what I try to spend but I try to make sure that   I've got that zero always and then if I'm gonna \nhire somebody I will build more than that ten   thousand and make sure that I've got the money \nto hire them but I would just treat as long as   you got 10 grand in the bank you know you're okay \nyou can breathe a little bit but um again you're   going to get a check for 5 000 and then all of a \nsudden you have to buy 7 000 materials and then   you so you're just gonna see your bank account \ngo crazy and that's one thing I never really   expected when I went into business now if you're \ndoing service work your bank is probably going   to be a little bit more steady you're probably not \ngoing to have a whole lot of crazy stuff like that   but it depends I mean you could build a 400 amp \nservice and now you got to go buy eight thousand   dollars worth of gear to put that service together \nyou know so you you just don't know what's going   to happen you don't know what kind of jobs \nyou're going to take on and everything like   that so making sure that you can pay for all of \nthat is really important I don't recommend people   utilize credit uh and start putting yourself in \ndebt to run a business I think as long as you can   provide a service and it brings in Revenue I think \nat first that's the responsible way to go about it   getting trade lines of credit at the supply house \nand all that stuff later is fine but you could   also end up with a situation if you still have a \nlower balance in your bank account that you can't   pay off the materials and then you're gonna have \na bad relationship with the supplier so just make   sure I would stay at ten thousand as your zero \nand kind of build up from that and once you're   you know 15 20 grand something like that then you \ncan start thinking like okay I'm now I know how   the business operates now I know seasonally you \nknow you've gone through like 12 months of a of a   whole year to figure out seasonally what's going \non material shortages all that kind of stuff so   um this is another reason for number one why \nyou want to work by yourself and for yourself   so that you can really fully understand from a \nbusiness side what the field is because you as a   journeyman for the last 10 years you haven't been \na business owner so it's a completely different   skill set to shift over into thinking about \nbusiness and you need some practice and time   doing that I think the best way is just keep that \ntable so that ten thousand dollars equals zero in   your bank account number three hiring so I said \nwork by yourself for yourself for a while right   um depending on how much money you're making \nand what you're doing with your money and what   kind of like Niche that you're in or anything \nlike that I think it's a smart idea to save up   a certain amount of salary for somebody before \nhiring them so for me if 10 000 is my zero then   I want to hire somebody let's say I'm paying them \nfive thousand dollars a month or whatever this is   a round figure that's probably around 30 bucks \nan hour if I'm gonna spend five grand a month   I need to know that I've got three months of that \nput aside for me to feel comfortable because you   might hit a lull something might happen with the \neconomy whatever another like pandemic happens   something like that so you need a cushion of money \nto make sure that even in a lull or when you've   got some huge job that you got to spend a bunch \nof money on making sure that at least the salary   portion you've got set aside so I would probably \nbuild up if you're paying somebody five thousand   a month I would you know spend I would take 15 \ngrand keep in mind you also have to pay payroll   taxes so from those of you that don't know when \nyou pay an employee right 20 of their check comes   out in taxes and goes to the government that \nsame 20 percent you have to pay on top of it   so the government gets double taxed for that one \nemployee's hours so you're gonna have you know uh   if it's like a thousand dollars a week that's two \nhundred dollars taken out for them 200 taken out   for youth three months that's two four six eight \nso that's that's uh another twenty four hundred   dollars that you have to set aside so 15 grand \nplus 20 2400 but as little as long as you've got   their salary put aside and you've got about three \nmonths some people disagree some people are like   no you need to have six months whatever whatever \nyou want to do but at least you've got that set   aside so that when you bring them on you don't \neven have to really touch that money as long   as you're bringing in money and everything's fine \nand you're able to float because here's the thing   when you bring in a journeyman they're a revenue \nearners so they're going to be bringing in more   money you know if you can bring in five grand \na week and they can bring in five grand a week   you shouldn't have to touch that money at all you \nshould be able to pay with your operating expenses   but having that money set aside will allow you \nto pull from it if you need to and I think it's   just more of a responsible way to go about it the \nother thing I mentioned earlier is don't just hire   an apprentice as your first hire I know a lot of \npeople are thinking okay I have all this work and   I just need help really I just need a hand so \nthat I can do two-person jobs and I can charge   more money for two-person jobs but unless they're \nbringing in a bunch of money and you're this small   they're gonna cost you so much more than they're \never able to bring in they can't be left alone   plus you're gonna be sitting there babysitting \nso they're gonna take your time and make you   take more time for every single thing that you're \ndoing so bringing an apprentice on I think should   be down the line when you've got a couple of \nJourneymen and you've you've got a solid stream   of Revenue earners that are bringing stuff in so \nyou can afford to bring a helper along and move   that helper between whatever jobs need help to \nhave like just an extra hand that can learn along   the way so that's that's my thoughts about the \nwhole thing number four stick with what you know   uh I have done jobs that I probably shouldn't have \ndone and I've had situation well really just one   situation where I tried to tackle something that \nwas way beyond my scope of knowledge and it was   big enough and it got to the point where I had to \ntell the customer I was like look I bit off more   than I could chew with this I was I know how to \nfigure out solutions to problems so there's really   nothing I can't do but some of this was like heavy \nequipment and like really weird situations and   stuff and I the people that were supposed to do \nthe underground didn't do things right so like I   had to just figure out all these crazy things that \nI had never done before and it just ended up being   a nightmare and rather than the customer being \nlike oh this guy is just terrible doesn't know   what he's doing I was just honest with him and \nI was like look I bit off more than I can chew   there's a little bit beyond what I know how to \ndo so I'm sorry for that but I am going to find   another contractor that's another company that can \nspecifically do this thing and I'm gonna make sure   that I bring somebody in that can help and handle \nthis situation and they were totally fine with   that and the situation was resolved I paid them \nto do this I had to eat a little bit of the you   know the revenue there was no profit I just lost \nmoney on it but it was a Learning lesson for me   when I was when I just got my master license and I \nwas eager and I just wanted to accept every single   job out there so this idea like do what you do \nreally well and just stick with that you need to   find your Niche so if your Niche is industrial \ndon't start a residential Electrical Company   you're not going to know anything about codes \ninspections you're not going to know how to wire   houses you're going to do all kinds of crazy stuff \nthe inspector's going to walk into your house and   be like bro you know nothing there's no way and \nthen you're gonna have to hire a company to come   in and like consult with you on how to wire a \nhouse you know what I mean so stick with what   you know it's okay to Branch into other things and \ndo a lot of research and try to take on something   that's a little bit beyond your scope but you just \nneed to do a lot of due diligence and research to   make sure that you're actually doing it correctly \nand having another group of people around you that   you can ask maybe some other Master electricians \nsome inspectors things like that so that you can   gather information about like how how should I do \nthis is this way too beyond what I'm you know what   I should be doing in general if you just stick to \nwhat you know and what you're good at it'll allow   you to to grow as a company and you'll be known \nfor that kind of a work and you won't get into any   crazy situations where you're working outside \nof what you know number five find your niche   so if you can pick rather than taking every \ncall that comes in and trying to do every   bit of work and every single thing pick one \nNiche so if you're going to be residential   new construction be residential new construction \nif you want to handle residential and Commercial   new construction because you're really great \nat both of them and you can set your shop up   and your people and everything to do that \nthen do that if you're industrial only   stick to Industrial like do figure out what your \nthing is because the electrical industry is so   broad we have people that are doing solars we \nhave people that are only doing signs their entire   career they've got multiple license licenses that \nyou can get I mean a master sign electrician you   can be a journeyman sign electrician all you \never touch are like pylon signs and Monument   signs and like signage on buildings and things \nlike that so just that's a whole career you   could be residential new construction you could be \nresidential service and troubleshooting which is   not new construction at all it's way different \nskill set same thing with commercial you'd be   commercial new construction commercial service \nyou can be industrial new construction Industrial   Service you can do facility maintenance you could \ndo data centers where all you're doing dealing   with is like DC and power supply servers things \nlike that you could work in like very specific   types of facilities that have highly specialized \nskill set you could work in doing generators   um you know backup power ups stuff like that for \nlike small scale operations instead of at data   centers and things like that there's a million \ndifferent kinds of electricians that you can   be so don't just whatever comes your way try to \ntackle it you're gonna end up doing way more work   than you need to for the amount of money that you \ncould otherwise just make by sticking with your   thing so I will turn away a lot of work because \nmy methodology is I would rather charge a premium   price provide outstanding service so I will get \neverybody's callbacks and I will get tons of   recommendations from people by just being Stellar \nnot being a bottom feeder trying to do cheap   cost cutting and then showing up and really not \ndelivering really well I want to be higher Echelon   than that and I want to be known for a thing \nso I can charge a lot of money for doing that   thing so if I can do three jobs a week to make \nten thousand dollars because I'm charging a lot   of money I would rather do that than do 30 jobs a \nweek to make ten thousand dollars and burn myself   out and burn all my employees out and everything \nlike that and the way you can do that is being   known for a certain thing and kind of sticking \nin your field in your lane and your Niche and   it's definitely okay to hire other people on who \nhave expertise in other things and then you kind   of Branch out into other things that's totally \nfine but I think picking a niche especially when   you are fresh into this figuring out what you can \ndo what you're really good at charging what you   charge so you can do less work charging a little \nbit more maybe to do less work but it's also okay   when I started my first electrical contracting \ncompany I took every single call everything didn't   matter what it was I did so much work I never \nwanted to touch and I burned myself out and I   tried to undercut everybody's pricing I tried to \nlike I just had a problem saying no I didn't want   to say no I wanted to be the one that when you \ncalled yeah you can get me out there it's totally   fine and then I was three months backed up and \nI had to keep telling people no I'm I'm out the   door for three months I can't come out there but \nthey might they liked my personality they liked   my kind of like bedside manner or whatever I care \nabout people's kids and I play with their dogs and   you know like I when I show up I show up like \na friend sort of so I'm I'm kind of a lovable   dude I think as an electrician so people just \nlike me they trust me they know that I'm going   to do good work they know I'm going to be honest \nthey know I'm always going to show up when I say   I am and my word actually means something and \nthat's one thing people love to be able to rely   on you and your word means something and they \nknow no matter what you're going to handle it   um so I like I kind of developed a reputation so \nlike very quickly I realized like whoa hey I'm   not charging enough I'm getting way too much work \nall the time so I need to raise my prices so some   people like get turned off by it and they go away \nand I need to figure out and stop taking all this   crazy stuff and figure out what are the jobs \nI want to do and take all these advertisements   and cut out half the stuff that I'm saying that I \nwould do and just do the things I want to do and   charge more money and be like a stellar dude and \nand do great work and I found I'll make the same   amount of money but my hair is not on fire and \nall my people aren't having to work till like   nine o'clock at night because I scheduled this \ncrazy stuff and everything's taking too long and   you know everything's just on fire all the time \nso def definitely figure out what your Niche is   and stick to that at least for a while number \nsix stop using pen and paper for everything   this is 2023 literally everything you could \npossibly write down on a piece of paper is in   digital form now you can run your entire company \nfrom an app everything all your marketing all   your Communications with customers all your \nCRM which is a customer resource customer   customer Resource Management \nwhat does CRM even stand for   customers something what are but it's uh it's \nhow you take in people's information so you   can run an entire database of every customer \nyou've ever had their address how much money   they've paid you every job you've completed you \nthere's ways that you can communicate with people   so that uh you know like through an app I can \nactually communicate and let you know that I'm   on the way for example something I'm using is this \nsoftware called market so if I do service calls I   can put in all of the information that I want to \nfor a customer I can send invoices through the   software I can give estimates through the software \nI can tell the customer that I'm on the way that   the job's complete I can completely communicate \nthrough this entire app and I can run my business   through the app and I can track employees I can \noffer lines of credit I can do all this stuff in   an app so like instead of having a calendar on \nthe wall and a pad of paper in your truck and   all of these things handwriting up all of these \ninvoices use technology like again it's 2023 we   have ai now ai is going to run the world there's \ntons of company companies that are operating to   allow AI integration into things but what markets \ntechnology does really well is it takes all of the   difficult stuff all of the different crazy pieces \nall the problems that we need to solve with all   these separate things and it compiles them into \none place and you can run your entire business   with the software so if you want to know more \nabout it check out the link in the description   below for Market rad software definitely check \nit out number seven use reviews to your benefit so a lot of the old school cats don't like having \nthe ads out on you know like reviews and stuff   like that they don't like keeping up with it they \ndon't want the kind of work that comes in in the   service calls and the things that come in that \nare review based they'd rather have their Core   group of builders that they deal with than just \nhave a relationship that's based off Word of   Mouth which is great might take you 20 years to \ndevelop that to get the kind of business that you   want reviews that's how people search for work \nnow in today's modern world we use technology   which I just talked about to say Hey where's an \nelectrician near me boom pop-up results those   results have reviews I always sort by top rated \nso if I'm in the map view of Google and I see all   these companies pop up I sort by top rated and \nit gives me the highest reviewed thing and then   I can go in and read reviews and how these people \nwork and everything so I actually use reviews to   hire other people if I see somebody with like \n17 reviews and they have a two star rating I   ain't hiring you I don't care if you're like \nTriple A Electric because you're trying to hack   the alphabetic stacking of ranking of things but \nyou're actually terrible like I don't work that   way so I use reviews in my business because I know \nthat it matters to customers not because like oh I   don't want to deal with it it's just stupid well \nit's yeah there's a lot of things that are stupid   but if you want phone calls and you want business \nthis is how people search the internet right now   the unfortunate thing that's a little irritating \nis that companies like Angie Home Services Home   Advisor stuff like that house Yelp they are so \ngood at SEO that their results will come up before   all of the real results from actual people so like \nmy electrical contracting company it's never going   to be first on Google because Angie's is going \nto be like top 10 rated electrical contractors   near you and all the people that pay them they \nSEO push and pump those names in there so their   list is going to be the most relevant top of the \nlist and then you got a you know Home Advisor is   going to be next and then house is going to be \nnext and then Yelp is going to be next so all   these paid lead feed services are going to have \nthe top ratings and only the companies that work   with them are on their site so you won't even \nshow up unless you're using those sites and you   can't out SEO this size of companies that these \nthings are you could you could probably be a mad   con a Content House of of you know like constantly \nputting stuff out and just outpace them with SEO   but the sheer volume of customers that they all \nhave means that there's always going to be a money   collector that's in between you and your customers \nand that pisses me off like no other but rather   than being mad at it and just being like I'm not \ngonna do it no I'm gonna do it because it's the   only way that I can make sure that I'm relevant \nno matter where they click when a customer is   looking for an electrician everywhere they click \nmy name is so that's me gaming the system and just   taking the bullet and even though it pisses me \noff I still do it I don't fight it I respect it   because it's the way things are number eight treat \npeople well this is huge I know some old school   cats that try to answer phones and they're like \nyeah and it's like bro is that a customer yeah   you say yeah to your customers answer the \nphone be like hey so-and-so electric what   can I do for you today be like presentable \nlike this is business right this isn't you   drinking with your buddies be a nicer version of \nyourself when you're on the phone with customers   when you're talk when you go into somebody's \nhouse if it's like an elderly people understand   where they come from they're probably going to \nwant you to take your shoes off or they're going   to see you at least taking your shoes off as a \nsign of respect because that means something to   their generation there's some cultures where also \ntaking your shoes off at the door is respectful so   if you see a pile of shoes at the front door like \noutside and you go up to the door at least ask be   like hey would you like me to take my shoes off to \ncome into your house and they will love it they'll   be like yes the fact that you thought of that like \nthank you so much you can even say is it okay I'm   gonna have to keep coming in and out of here and \nI got all these boots I don't want to lace this   up and keep on doing this because I'm in and out \nwould you be okay if I just put some like booties   on and took them off a lot of them will be like \nyeah that's fine but the reason that they take   their shoes off is because they view their houses \nlike a sanctuary and it's a respectful thing to   take shoes off to be in a household so you just \nlike understanding things it kind of just means   caring about people right like not just showing \nup like being a filthy dude looking in people's   homes if you're full of grease and stuff like \nthat go to a gas station wash yourself up real   quick before you go to your next service call you \ndon't want to show up like a dirt bag you don't   want like have respect for people when you when \nyou deal with people most of the work I get and   the reason why I have so much damn work I don't \nknow what to do with when I'm out doing my thing   is that people just love me it's like and I'm \nnot sitting here trying to be braggadocious or   like self you know like full of myself I make it \na point to care about people and not pretend that   I care not be out here fronting like I really do \ncare about people when I go to a customer's house   I'm asking them stuff about their life like hey \nso what do you do for a living you know there's   a game to it I'm trying to figure out stuff that \nI can remember about them so the next time I do   business with them I can be like hey how's your \nkid like you told me he was doing the football   thing last time or whatever and I'm actually \nlistening I'm not asking a question and then   my mind's over here doing other stuff I'm like \nI'm talking to them eye contact smile and being   like a decent person because you have to think of \nthings not from your perspective you have to think   of things from the customer's perspective you're \nthe strange person in their house if a strange   person that doesn't talk much is really Gruff is \nfilthy and doesn't want to talk to me is coming in   and out of my house and then just hands me a bill \nand leaves I will never have that person back ever   but if somebody comes in and they're like hey man \nhow you doing today oh my gosh thank you so much   for the opportunity to be here what's your problem \noh you know what like I am such an expert at this   thing like I you have no problem I'm gonna take \ncare of you I know what the problem is or even if   you don't know the problem be like you know what \nI've never run into that before but I'm really   good at figuring stuff out and I've got some you \nknow let me do a little bit of research and I'll   get an answer back to you instilling confidence \nin people when they're sitting here with you   coming into their house most of the time it's \nkind of a scary thing for customers not for you   who understands trades and those around trades \npeople and gets it but like even trades people   coming to a house is kind of a a scary thing so \nlike how you show up matters if you're wearing   nice clothing and you're clean and if you've \ngot you know like you're really attentive when   they're speaking and you care about things and you \nsit and listen and respect them and think about   ways to respect their homes even another elderly \nexample I take my hat off when I go into elderly's   people's houses a lot of people from you know like \nmy my parents parents my grandparents generation   it's a thing they don't have you don't wear a cap \nat a table when you're sitting down to eat dinner   when you're in inside my grandma used to be like \nhey we don't allow woodpeckers in this house you   know like take your hat off it's just a respect \nthing so just little things that you can do to   turn out to try to respect people's domicile the \nbetter um don't pretend like you know stuff when   you don't be honest and say you know I actually I \nhave no clue but I I will find an answer you know   God I'm really good at finding stuff out so uh \nlet me do a little bit of research and I'll see   what I can come up with but instilling confidence \ninto people is huge as long as you are constantly   showing up and being like a great human outside \nof your trade and your craft and the things you   know and the tools you're wearing be a great human \nbeing with other human beings they will love you   for it because 80 percent of the people that are \nshowing up it's obvious they don't care they're   just there for money and you're gonna get all \nthe callbacks because they're gonna be like yo   sister so so and so I just met this \ngreat human and they're an electrician   I'm going to give them to you because if you \never need an electrician or if they've hired   five electricians and you're the one that shows up \nand you're like super awesome to be around they're   gonna always remember you with someone their \nboss is like hey do you know anybody that's an   electrician they're gonna be like oh dude there's \nthis guy I met he's such a good electrician such   a good person like oh my God you're gonna love him \nboom get the business every person I meet can say   that about me and I just know that about myself I \nknow I fully give myself to everybody any of you   that are like followers that have met me in person \nI'm pretty sure if you ever ask them would agree   like this version of myself is the same version \nI am everywhere no matter who I meet if you're   a follower and I'm sitting there talking to you \nand we shake hands and you're talking I'm asking   you about your business and what do you do and \nwhat kind of electrician you are I give a [ \_\_ ]   I really give a [ \_\_ ] about the people that I'm \naround and so I think if you do that if you kind   of mirror that behavior really show up really be \npresent really think about how you're coming off   um I think it's really important if you want \nto continue to get calls and get great word   of mouth and get great reviews so that's \nall I got for you let me know if there's   anything I missed and there's probably 30 \nother things I should have talked about   but I gotta stop this at some point so \nlove you crazy people thank you so much   for all the support for always watching \nleave your comments below talk soon bye"

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"VideoID": "39",

"Title": "Pricing method for Electrical jobs / Most profitable method / Chicago (New Construction)",

"URL": "https://www.youtube.com/watch?v=5ZYE2Ko-y2Y",

"Keyword": "Electrical construction techniques",

"Transcript": "hey guys hey I'm gonna show you guys um how I price I don't know how everybody's different right everybody has their own technique but this is high price that way the customer knows exactly why his prices the way it is and he can change things add things to subtract things and it'll affect the price and on my end uh I know that at the end of there's gonna be enough money man because I I know there's probably some new guys out there that probably saw this would have charged like like 5 000 bucks and and then when you're in it and you're like stuck and halfway done and it's gonna cost more than what you have you're gonna blow man we're going to charge so I I have a system and let me get to it man I want to give my shout out to um Matthew and Angel for making this video possible uh by both of them going to sleep at the same time so we got some time guys hey first thing I want to do is usually I got to get a blueprint I'll show you guys two examples right on this one I had to go there and measure all this out and if you can notice each square right here uh to me it's uh two two feet right so if I was to measure like let's say the dining room if it was 20 um feet I would only do like 10 squares right and it was 10 feet I would do five squares boom really simple stuff man honestly really simple stuff but you do need a diagram well and this is my technique at the end of the day if you guys are a pro it's not this video is never really gonna do you anything all right so real quick this is the fastest method too okay real quick is I want to get all these rooms over here so I'll make a list I'm gonna just work on this and and talk through it as I go but this is high priced stuff and I'm able to do a three unit fast and if they add things or subtract things it reflects the price and then by the next time they know their own price so they'll call you and be like with with them in their head already know it all because it's probably roughly gonna charge me this much right so let's say you gotta label all the rooms right living room dining room this is technically the kitchen I'll leave a picture of the kitchen layout and in the beginning of the video but it's pretty much here all I'm worried about is uh the fridge uh the stove the microwave dishwasher and they got a sink here we'll get to like the codes and the requirements and what circuits you need and all this other stuff throughout this video but this is this is like Just My Method and worst case I I know my boys are gonna be watching this video so I gotta explain it as much as possible hey so like the only symbols that you really got to worry about all right your outlet your light uh switch and you're like it's photography that's all you're ever gonna have inside a building right stabilize this okay all right so for the living room uh obviously living room they're gonna need a lot of outlets so just obviously this is drawn to scale so just in your head will make sense obviously they're gonna need another there and now they're there and I'll live here and then we'll put this one back okay and how much they're gonna have what one entrance this is this this right here doesn't even count okay we're gonna have an entrance obviously we're gonna have to turn on the light somewhere gonna probably be over here and for right now this guy is literally just one we call it section eight just one like just enough right so right now all we did was just Mark out the living room and then the homeowner if he wants to have more age but you know you can change it there so anyway so I'll mark living room here and then I'll just count the outlets one two three four five five hours uh obviously it's gonna be only one switch and obviously just went late right and then I'll do the same thing for for all the other ones this is technically a bed let's say this to be bad too right so let's work on bed one first oh and honestly uh the bedrooms are almost the same each time and I'm gonna show you guys the trick too on how you can charge more man but that I'll make that one at the end it'll be a surprise see if you can figure out what's going on all right so usually bedroom one bedroom two are usually bedrooms have four Outlets one in each room two switches one your main one and then the one inside the closet and two lights which is uh the closet light and then the center light so those are always we're not always four two two but honestly most of these bedrooms are all the same size so look one two three four you see there goes a four and then one switch here and then your light and then one switch here and then you're like so there's always the same thing four two two let's unless it's a big bedroom or they got a lot of candles so we got the two bedrooms out the way the two closets out the way this was out the way uh for this one like like there's something like this uh dining closet let's name this dining closet we'll give it a name and then for something like this I'll go like here because you'll see what this is later but something like this I'll put an arrow and then I put a dining closet and all it is is a switch and a light I believe anything bigger than nine square feet you gotta have a light in there well at least in Chicago okay so that'll take care of that we did the living room already oh man we're gonna get to the the kitchen I'm gonna tell you right now the kitchen now that one's the the longest one so that one I kind of want to say for last let's do dining that way we can close up that big area hey dining this one's gonna have more Outlets obviously uh well one light in the middle man because I don't know what that guy's gonna do but for now usually Dinah has two lights two two light switches so if you're coming in through this side or you're coming into this sign um probably have two lights we're gonna put two it's gonna be he can't be too stingy I'm gonna tell him okay and then the outlets you're gonna probably have one maybe two three four well that's about it it's not this technically this is the kitchen right here oh you know what then that is one like because the picture is gonna have its own one and then it's gonna be that one okay so two switches one like true oh and then a lot of times they also have a chandelier so I want to probably be here or maybe not we'll see this is the good thing about my my plan they can add or subtract all right so dining we got what four Outlets two switches one way let's say five because I don't know dining room for this one right here okay uh let me see the hallway it's gonna be the hallway right here yeah don't let any rooms Escape man if you let a room go man I'm gonna tell you right now you're gonna lose at least 500 bucks all right hallway let's see Highway uh well let's just get one out of here went out in here let's say three Outlets this is just one one floor man okay I have another one that's three floors but that one's gonna take me longer I'll try to get it on on film and then I literally just finished one another uh two unit right now and I'm I'm on my YouTube channel I'm gonna try to make a a playlist for this one on raxine I'm doing just the ductwork and I'm fixing some electrical and I honestly they they had a guy that was charging them cheaper and he stopped calling me for like two projects and then you found out that it's not really that easy to find someone that knows what they're doing so we got the guy back so right now we got at least four or five projects to do I'm gonna try to get a video on all of them and you guys are trying to see um the process from beginning to end beginning to end I get to see a lot of stuff man I get to see a lot of stuff uh Highway okay for the highway this is where you get the guy for the house he's gonna have to need an outside light and an outlet in the bag same with the front well I don't know but he's gonna need it now then he's gonna need uh somebody's gonna need a oh man I gotta ask him because technically this is uh the open area right here okay and then probably two lights because or three lights because I have no idea what this is okay so Highway let me do the outside because there's two others yeah I have another sign two switches and two lights that's the front and the back so each One's Gonna have an outlet a switch you can turn on the outside light and the light that hangs outside to light it up when it's dark okay and then Outlets is gonna be going to two three hours two switches three lights so that takes care of this whole area right here okay bath uh you're gonna have obviously one Outlet you're gonna have uh two switches because there's gonna be a vanity light and two lights the exhaust fan and the vanity but right here bad and then that bag has a closet so over here just so we don't get confused all right a little arrow and I put closet and then I'll put a he's gonna need one switch uh one like that way there's no confusion guys you got to make sure you get everything man if I'm telling you you forget something that goes your lunch and get gas free lunch and gas just out the window and you still got to put it in because of that well I don't know if it's inspect it but you try to put it as many as you can okay this is the laundry all right some laundry all right so laundry is gonna have uh two outlets one switch one night and then there's a closet there and do one switch all right one right okay and I think all the kitchen all the famous kitchen oh man all right I think we're like 12 minutes and I'm almost done and then I'll show you guys the formula how I come up with costs okay uh this is the only thing that you really got to know about the kitchen in Chicago uh the stove in the fridge they have to be on their own breaker you can combine those two so stalker first it's already two outlets you don't need a switch or a light for them and so that takes care of the fridge and it takes care of the stove and then out of the microwave you gotta have one amp or one breaker dedicated so I put microwave uh just went out there obviously so that takes care of the microwave uh the dishwasher obviously you need to have a service switch for it and you got to connect it like an outlet okay and then the sink okay 15. in Chicago you got to have at least uh two uh circuits for just the countertops so you have countertops which would be like let's say left side of the sink so you have one two let's say two outlets and you're also going to have uh the sink light sink like so without even light and a switch and it'll come off of that circuit sink Lane one switch okay so that'll take care of that and then on the other one uh the other counter top Outlet circuit uh I'm gonna just put one right here dishwasher of one and then three I'll put three on this three is gonna be come to top three okay and oh man 16 is going to be uh kitchen oh man I will combine it but I rather run a circuit for kitchen lights and any Outlets let's say one here by the ground just so it looks like there's some more stuff besides that light and then uh the two switches for the kitchen one to okay I don't remember this guy had an island or not oh man okay let me stop and look hold on okay there's no island so technically that takes care of that square too so I believe I got the whole thing accounted for all right here and this aisle becomes the circuits very important man very important so now it makes my math easy so circuits I write it over here uh circuits uh let me see and then these are called openings right here oh man I gotta count them all up but I'll put it over here openings okay all right uh so circus we got one two three four five six seven eight nine ten eleven twelve thirteen circus with the 13 circuits I don't know about you guys man but okay and then I caught all of these uh let me see one three five six seven ten twelve fourteen fifteen sixteen Seventeen usually these are right here on the bottom 17. and double check you gotta double check man because believe me that guy's gonna be counting them each and everyone is going to be calling them so make sure okay your numbers are good because tonight's gonna play let me see what else he added you know okay uh one three five six seven ten twelve fourteen fifteen sixteen Seventeen okay Seventeen I'll write that down so I don't if you forget you gotta start all over so let's just do bye by Rose obviously okay these are five six 8 10 12 14 15 16 17 18 19. oh man I'm not sure let me count this again 5 9 13 18 21 23 24 26 28 30 32 33 36 way cool all right let me add these up and then we'll continue and so I I added up all the openings and at the end of the day he only has 72 openings which technically is not even that big of a job man but it is just one floor it's just honestly they will will probably be done like two three days but either way so this is uh after I get the price this is how I approached the guy and boy this is how you let the guy know how payment works because at the end of the uh everybody's got to be in agreement with the payment all right so look so at the other day uh for the circuits obviously I charge more because there's not that many and and that wire is expensive I think overall right now it's like kind of 120 over here and if you do our networks that's three three wires each time uh usually I do a lot of networks hopefully you guys know what networks are but I do a lot and that works all right so this is just the interior this doesn't even include the the panel or the ground or the service or anything like that but anyways so he's got 13 circuits later he can decide to combine them like if we sell it and I said let me get a let me get uh both bedrooms in one circuit okay fine you know not 250 down and they I mean it is what it is you know yeah but either way openings I got uh 72 openings so that's all of these guys so the guy decides to add or remove just this number will increase or decrease but the price is the same I don't even know if this is enough honestly this is the first project uh something like this I got like three more but if this is the point also where the numbers don't add up you can tweak things like uh right now I got 80 but you could easily make it 85 you know but this one this guy's one of my guys man it's my guy if anything is going to be helping me with his own house all right so let's say this is where you can round the number up or down you know depending just to make it a nice easy number like for this guy we could round down until I'm sorry it's like 9 000. nine thousand out the door sir uh but technically uh I'll tell this is what I tell them because you're gonna see the high price tag I'm like oh Lord uh this is where you stop them hold on hold on hold on technically I only need half uh to get to the pipe foreign piped up then uh no they'll give you 4 500 down whatever just you know go in there pipe the whole stupid thing real fast hopefully you guys are quick man don't be there all day and this is for new construction price I don't don't begin with somebody this price and then there's plaster ceiling everywhere and something if there was like a plaster ceiling I would probably be charging like 150 hopefully and maybe like 400 a second if it was like plaster I got some jobs that I've done like this but this is a new construction price just to get that clear uh either way 4 500 it gets you the uh the pipe technically it goes 50 down and then uh 35 percent and then 15 because technically there's three stages there's the rough uh there's the um well I don't know what they call this and uh in Chicago they don't like that you wired before they inspect the pipes so technically if you were if you were to like have your pipe ran and wired and the inspector walks in and technically he could possibly throw you right then and there because he uh Chicago this is for Chicago this whole Channel Chicago guys don't know tell me I can't get keys and I like that and no man uh yeah so there's three stages there's the rough uh the wiring and the Finish the rough is this right here pipe everything up oh and when you pipe try to pipe it as easy as possible so when it's time to run wire you can just go from here to here to here to here to here to here where's that switch at to here and then to here and then the power comes in here and then from here it travels everywhere all right don't start doing those silly stuff like this and then like that and then like this and then kick it it Chris thinks it's cool we put them all here because he can fold 90 degrees and then you got like eight wires here and then you got a big old ball of wires man just uh try to wire it like if if we were gonna wire the place like right here this is my switch I will have my home run come from the panel here and then boom boom boom boom boom and then this guy that you got from there boom and that's it yeah you want to make it as easy as possible me personally I don't I don't like to like cut wires and put wire nuts I like to just strip away a little bit of the plastic and wrap it around the screw and keep moving I'll show you guys I'll show you guys uh let me see no but that's it and then uh 30 I don't know what 35 of this is but I'm assuming it'll be like uh 4 500 over down boom I turned three thousand and then what's the balance I don't know but I'll tell them something like that you know all I know is it'll be 35 all right but anyways this is my quick video and I'm out of here man I got another one for duck work duck work and how to get your little list going on this is another truth I already got the whole list made so when I go to the store line and when I get to the job site same thing and then keep moving all right"

},

{

"VideoID": "40",

"Title": "Electrical Hand Tools | Most Important Electrician Tools",

"URL": "https://www.youtube.com/watch?v=OIO3hKyN7ko",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Music] do [Music] [Music] [Music] [Music] [Music] [Music] you"

},

{

"VideoID": "41",

"Title": "Cut in electrical box tip. #electrician #diy #construction #apprentice",

"URL": "https://www.youtube.com/watch?v=QKm9xfiKF\_0",

"Keyword": "Electrical construction techniques",

"Transcript": "these boxes are kind of tough to get in the in the wall when you have wires coming in the bottom and top so if you have the wire length just go ahead and loop those up and bring them all in the top see how nice and easy that went in there"

},

{

"VideoID": "43",

"Title": "I’m giving yall some tips ! #electrician #electrical #construction #work #trades #explorepage #skill",

"URL": "https://www.youtube.com/watch?v=zu343J92AB4",

"Keyword": "Electrical construction techniques",

"Transcript": "for"

},

{

"VideoID": "44",

"Title": "Must have tool for electrical work #shorts #electric #electrical #electrician #construction #diy",

"URL": "https://www.youtube.com/watch?v=jPC4hiVe\_3w",

"Keyword": "Electrical construction techniques",

"Transcript": "if you're doing any renovations or any sort of electrical work at all this is from klein tools so check this out you need to know where the breaker is for this outlet you just plug this in then down here at the breaker you just go along with this turn on you find out which one it is there we go so now these lights are off we know that the power is out to this outlet and safe to work with you can also use it with one of these sketchy looking devices so you can find out which circuit breaker controls which light and here's a little bonus it plugs right in the back of there for easy storage"

},

{

"VideoID": "45",

"Title": "What I do when I’m about to start testing an electrical control panel #electrical #controlpanel",

"URL": "https://www.youtube.com/watch?v=XF5ywqE8QWc",

"Keyword": "Electrical construction techniques",

"Transcript": "make sure that's isolated make sure all the breakers are in the off position make sure that ends not plugged in"

},

{

"VideoID": "47",

"Title": "The Power of Prefabrication: Streamlining Electrical Construction Processes and Timelines",

"URL": "https://www.youtube.com/watch?v=sABC22e8cgg",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] prefabrication or off-site construction and electrical work makes crews work more quickly and more safely it works extremely well on certain projects like an apartment complex here in seattle watch now on etv"

},

{

"VideoID": "48",

"Title": "8 Amazing Electrical Life Hacks | Tips &amp; Tricks",

"URL": "https://www.youtube.com/watch?v=-cuW5q7dJ1A",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Music] [Music] [Music] [Applause] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] so [Music] [Music] [Music] do [Music] you"

},

{

"VideoID": "49",

"Title": "Electrical Construction",

"URL": "https://www.youtube.com/watch?v=0IITBoJUewU",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] when i started at pwc i started off as a first class lineman and then i stayed lyman for roughly about four years and then the previous crew leader he got promoted and then i got lucky to get the job as a crew leader you keep everybody on the same page you doing the job safely mapping out work trying to be as productive as possible as safe as possible we're always dealing with new challenges and trying to keep everybody on the same page and understand what's going on most time the day starts off with uh you getting your job loading up materials making sure you have the normal stuff to just everyday working items and then the job costs for something special you load that up and and just you go out to the job uh then if it involves a pole you're changing out poles uh then some of the other some of the other stuff that comes up is like power outages you have to keep up with them they kind of take priority and just every day is a something different it might be the same same concept but there's a different situation in everything pwc is a really good place to work they they're there for you um it's like a family no matter what department you're in everybody talks everybody says hello there's just a really fun place to work and of course the money is great but that ain't that ain't what keeps you happy because i mean it don't matter how much money you make if you're miserable and you're going to be miserable if you're going to pursue this career take a look at the whole picture and make it make sure it's something you're going to enjoy make sure it's for you and then just work hard pay attention and work your way up through the ladder [Music] you"

},

{

"VideoID": "50",

"Title": "Electrical issues on a new construction home. #thataintright #homeinspections #fyp #viral",

"URL": "https://www.youtube.com/watch?v=2ab2GO8N5\_8",

"Keyword": "Electrical construction techniques",

"Transcript": "trade with ghost star inspection electrical panel new construction let me show you what we're looking at all right first this new construction we don't have afci breakers in this panel that ain't right second we have a 40 amp breaker that's tripped already coming up here and the the wire is wrong so 40 should be eight i have a wire gauge and it's actually same for 30 30 is 10 so this wire going to the 40 amp breaker is 10 is smaller it should be bigger eight is bigger and finally we have a grounding rod that's not in deep enough and it's loose all that ain't right bad new construction"

},

{

"VideoID": "51",

"Title": "Did you know this about switches? #shorts #construction #diy #electrical #tips",

"URL": "https://www.youtube.com/watch?v=ynkYBd1GhjI",

"Keyword": "Electrical construction techniques",

"Transcript": "i'm about to show you two things about a switch that'll blow your mind if you take a look at the back of a switch there's what's called a strip gauge and it shows you exactly how much insulation you need to take off your wire to make the perfect loop to go around the screw that secures the wire to the terminal and also if you install your switch upside down it's going to tell you no for more diy tips be sure to tap on my profile subscribe to my youtube channel"

},

{

"VideoID": "53",

"Title": "I wonder if he fired the guy who measured😬🎰#concrete #construction #work #cdl #trucking #business",

"URL": "https://www.youtube.com/watch?v=UOfowiXIG-Y",

"Keyword": "Electrical construction techniques",

"Transcript": "today i gambled eighteen hundred dollars at this chino hills ford dealership i got to the job and i told the contractor hey where did you get 60 plus calculation for this job this is only a 50-yard job i don't know where you're getting 60 yards from please fire whoever you're you hired to measure your concrete and he said oh are you so sure what if i need six trucks are you gonna give me the six for three i said yes shake my hand we got a deal he said okay but i said wait if you only end up needing five you're gonna pay me for the six truck and he said you got yourself a deal and i ended up pocketing an extra eighteen hundred dollars"

},

{

"VideoID": "54",

"Title": "Stay grounded ⚡️ #electrician #electrical #construction",

"URL": "https://www.youtube.com/watch?v=ssy8KUozUdI",

"Keyword": "Electrical construction techniques",

"Transcript": "so we are starting a remodel of a house that was built in 1890 so you know what that means good old knob and tube wiring as most of you know knob and tube wiring was the method of wiring back in the late 1800s until about the 1930s or 1940s and the danger of knob and tube wiring is that it is ungrounded and so if you have circuits that are not grounded this is a huge risk for house fires it can cause Arcane and it is very unsafe to live in an environment where nothing is grounded so if you have any remodels coming up especially with these older homes look for this knob and tube wiring in my opinion needs to be replaced every time"

},

{

"VideoID": "55",

"Title": "Knob &amp; tube wiring #diy #electrical #homeimprovement",

"URL": "https://www.youtube.com/watch?v=yDFMqRMGbyk",

"Keyword": "Electrical construction techniques",

"Transcript": "so that's the end to my light fixture and you can see here this is connected to knob and tube wiring so let me just cut this real quick and I'll show you that"

},

{

"VideoID": "57",

"Title": "What is Electrical Construction? What we do. | Sasco Contractors",

"URL": "https://www.youtube.com/watch?v=oUpUT3oF0Xk",

"Keyword": "Electrical construction techniques",

"Transcript": "sasco is a full-service a licensed electrical contractor with the ability to take on any size of project with a wide range of customers across different ici construction markets industrial commercial and institutional when you hire sasco you can expect that we have the ability to meet the most aggressive schedules and be involved with all electrical facets of your project regardless of the complexity or scope when our customers realize the value we bring to their projects and how much our people care about what they do they tend to call us time and time again it doesn't matter if it's a thousand square foot tenant improvement or a hundred thousand square foot fiddle our process is the same do it once do it well do it safe make our customer happy some of our relationships last over 35 years and we want the relationships that we create today to last another 35 years at least from food processing plants to mines to university campuses we have experience with the massive range of work customers and environments if you need help with electrical construction projects give us a call or email us at info [Music] saskocontractors.com"

},

{

"VideoID": "61",

"Title": "How to route electrical conduit across water pipes. #electrican #plumbing #construction",

"URL": "https://www.youtube.com/watch?v=1FRBysmfP4w",

"Keyword": "Electrical construction techniques",

"Transcript": "how to route electrical conduit across water pipes during tiring work hours do you want to bring some laughter to your colleagues I asked my new Apprentice to Route the electrical conduit across the water pipes but the condition was that it shouldn't stick up above the floor everything must stay below since this floor will be covered with wooden flooring he came up with a NASA level method to Route the electrical conduit across the water pipes but water was still leaking too much I asked him to fix it and here's the expected result no more leaks amazing right laughter on the construction site helps to relieve fatigue during breaks goodbye"

},

{

"VideoID": "62",

"Title": "Tile Tips for Electrical Outlets - #shorts",

"URL": "https://www.youtube.com/watch?v=z-193EpRxC0",

"Keyword": "Electrical construction techniques",

"Transcript": "These tips will help you cut out an electrical\noutlet hole in a tile. The first step is to cut down the tile. I using the Masterpiuma snapper, it's awesome. Then you want to draw the outline of the outlet\non the tile using a speed square. Try to make this as accurate as possible. Then you can use the Squadro, this is a great\nlittle diamond blade. It's 3-3/8\" and fits on the short side and\nthe long side of the electrical outlet. Then you can clean up the edges of that cut\nusing a diamond polishing pad and in the end, you'll have awesome results. So hopefully these tips help out."

},

{

"VideoID": "64",

"Title": "Rack-A-Tiers New Junction Box #electrical #construction",

"URL": "https://www.youtube.com/watch?v=5BQDjphptR4",

"Keyword": "Electrical construction techniques",

"Transcript": "all right so this is so common to find in houses I don't know why but people do this all the time and it's dangerous they just wire nut the wires together don't even put it in a box and it's a pain because you have to undo everything feed it in the Box remake your connections put a blank cover on it but now racketeers is selling this open spice junction box makes it so much easier you don't have to undo anything it has tabs right here where the wires can just slip in from the top so let me put this in here and show you how quick and easy it is all right so I went ahead and just screwed it down got my wires bent so it'll fit in there fold the coat cover over snaps in place and then there's these two screws as you can screw in to secure it and you're done it's that easy now I can get out of this hot attic much faster"

},

{

"VideoID": "66",

"Title": "Is your meter to high? #electrical #construction #constructionlife #electrician",

"URL": "https://www.youtube.com/watch?v=piGqhYPhq\_c",

"Keyword": "Electrical construction techniques",

"Transcript": "this is y with power source electric so we got a call from this customer as you can see their meter's a little bit too high so and any meter is supposed to be 6 ft to 4T as you can tell that one I'm 6 feet tall that meter is way too high and it doesn't have a shut off either so what we did is we install the new meter with a shut off we got it at the right height if you have a meter looks like that give us a call power source Electric"

},

{

"VideoID": "68",

"Title": "How to pass rough electrical inspection on main panel",

"URL": "https://www.youtube.com/watch?v=l-gOTyql6RM",

"Keyword": "Electrical construction techniques",

"Transcript": "hey guys vinnie the handyman really quick for this short video i just wanted to go over um our romex going out to the main electric panel we've got fire blocking all the way on the inside you got fire blocking coming in from under the basement so everything looks nice and clean we got our staples right here on our two by fours inspectors like to see everything nice and secure so this is a good install of all the romex going into the main panel so here you have your um washer and dryer you got your grounding okay you got your 12 twos your 14 twos everything looks really organized all the colors are matched together this is this was really clean work anyhow that's how it should look if you guys want to pass your inspections"

},

{

"VideoID": "71",

"Title": "Electrical safety basics | Electrical safety rules",

"URL": "https://www.youtube.com/watch?v=k-HRy3eh36Y",

"Keyword": "Electrical construction techniques",

"Transcript": "lockout and tagout should be done while the machine is under maintenance by isolating the power supply all the rotating parts should be guarded never wear loose clothes at machines all the portable equipment should be with three pin plug and three pin power supply portable lamp should have a mesh guard and it should have supply of 24 volts never change the place of a halogen lamp when it is in on condition no one should alter the electrical connections at any condition only trained and authorized person should do this"

},

{

"VideoID": "72",

"Title": "Electrical Construction Plans &amp; Layout Drawings: Sample House",

"URL": "https://www.youtube.com/watch?v=Ij\_YL2Ge6lE",

"Keyword": "Electrical construction techniques",

"Transcript": "electrical construction plans are detailed blueprints that outline the layout components and wiring systems of an electrical installation they are essential for electricians and contractors to ensure safe efficient and code compliant construction site development plans shown here are comprehensive blueprints that outline the proposed land use infrastructure and improvements for a specific site they serve as a guide for Architects engineers and planners during the development process ensuring that the project align with zoning regulations and environmental consideration key floor plans shown here are detailed diagrams that show the layout of a building or space including rooms walls doors windows and furniture placement they provide a visual representation of the structures design and are essential for Architects Builders and homeowners to understand the spatial Arrangement and functionality of a space architectural floor plans are detailed diagrams that show the layout of a building or space including rooms walls doors"

},

{

"VideoID": "74",

"Title": "Electrical Tips in Roof concrete | Deekshi Homes",

"URL": "https://www.youtube.com/watch?v=Yf6CPF9jiNE",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign"

},

{

"VideoID": "75",

"Title": "Wiring a shed, Pulling Wire through pipe 3x faster #tinyhouse #electrical #construction #diy",

"URL": "https://www.youtube.com/watch?v=lToYcbIg5gs",

"Keyword": "Electrical construction techniques",

"Transcript": "this is Tim with the Jacks of all trades and I'm going to show you the fastest way to pull string through an electrical conduit using nothing but a water bottle the string a sandwich baggie and a vacuum cleaner let's get to it"

},

{

"VideoID": "76",

"Title": "Electrical Outlet Tip #diy #electrical #shorts #homeimprovement",

"URL": "https://www.youtube.com/watch?v=S5DwgIPxbvk",

"Keyword": "Electrical construction techniques",

"Transcript": "So this is\na common problem I see in a lot of homes. We have an air conditioner unit and it's plugged into an extension cord that goes about 12\nfeet over that way. As you can see, there's no outlet here. So I highly advise you put a dedicated\ncircuit for an air conditioner unit. Some of these old homes built in the 1900s\nmight even still have no idea to wiring, and it was never designed to hold\nthe power load of something like this. If you did not have the luxury that I have\nwith being able to run that wire in an open wall downstairs,\nthis is huge. One of these long bits. When this outlet is out,\nyou can drill down to that bottom plate and then take these sticks and connect them together and fish them\nall the way down to the basement. So definitely a lot more challenging\nwhen you don't have a wall open up below\nas if you had the balloon framing. If you had a different type of wall\nsystem, it's going to make it even a little bit more challenging."

},

{

"VideoID": "77",

"Title": "How to install outdoor electrical outlets in stone siding #electrician #tips #howto #gfi",

"URL": "https://www.youtube.com/watch?v=R672LpOdfcw",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Applause] a"

},

{

"VideoID": "80",

"Title": "How to make an electrical pigtail #shorts",

"URL": "https://www.youtube.com/watch?v=PQZgKjfGZJ4",

"Keyword": "Electrical construction techniques",

"Transcript": "are you familiar with pigtails no not these ones these ones electrical pigtails let me show you what i'm talking about when you have two or more cables entering a box you'll have two code compliant methods for terminating the wires now method number one would be to through wire the device and method number two would be the pigtail so what does that mean i'll show you so here we have two cables entering the box two hots two neutrals and two grounds so we're going to connect these wires together with tails that'll connect to the device so when we're done it looks like this so do you want to know when and why i choose to pigtail along with a great installation tip check out the full length video linked in the description down below and i'll see you over there"

},

{

"VideoID": "81",

"Title": "Electrical tips #short #shortvideos #electrical #electricalshorts #electricaltips",

"URL": "https://www.youtube.com/watch?v=KvOdOzYlNrs",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] you"

},

{

"VideoID": "82",

"Title": "How To Strip MC Cable Sheathing!￼ #shorts #tools #electrical #diy",

"URL": "https://www.youtube.com/watch?v=BbRWevahb10",

"Keyword": "Electrical construction techniques",

"Transcript": "I'm going to show you guys how to remove this cladding off this MC cable using this Roto split made by Southwire let's say I want to remove about a foot of this cladding off this cable all I got to do is slide it right in the channel of this Roto split and then tighten down this part of the tool and then simply apply a little pressure and then just start turning it like so and keep applying pressure until you have no longer have resistance and then remove it and twist it and then pulls right off as simple as that"

},

{

"VideoID": "83",

"Title": "Service loops are my best friend #electrician #electrical #construction",

"URL": "https://www.youtube.com/watch?v=GpFttjVT3uc",

"Keyword": "Electrical construction techniques",

"Transcript": "don't do [Music]"

},

{

"VideoID": "84",

"Title": "Prefab Modular Building Electrical Construction",

"URL": "https://www.youtube.com/watch?v=ebb4\_cnkN7s",

"Keyword": "Electrical construction techniques",

"Transcript": "all right on the electrical we're building from the inside out sometimes but here we've got uh lights are going to hang from the ceiling because they're going to be dropped inside of a suspended ceiling what we do at site you can see how the electrical system is run it's a nice protected cable we've got all the right circuits and everything is labeled it's got its right place and it's put exactly where it needs to go we run conduit for whatever we need to run a conduit for say alarm systems or telephones there's a lot of different options available here we have the electrical system that's run from the outside and they run dados in the lumber it's pre-cut and then they run their electrical raceway on the outside of the building and put dado plates in so you can't nail through it"

},

{

"VideoID": "85",

"Title": "New Build Electrical Fails",

"URL": "https://www.youtube.com/watch?v=3gNO7E8qIUM",

"Keyword": "Electrical construction techniques",

"Transcript": "right so for all those angry angry electricians that tell would have been cut during hot check here's the proof these hot checks are done about two weeks before my inspection [Music] let's see how good a job he did [Music] well that looks fantastic [Music] [Music] that also looks pretty amazing [Music] not GFCI uh GFCI but don't worry it'll get caught during hot check"

},

{

"VideoID": "87",

"Title": "A helpful tool to locate circuit breakers. #tools #electrical #tips",

"URL": "https://www.youtube.com/watch?v=8Bm7AsbFeWY",

"Keyword": "Electrical construction techniques",

"Transcript": "how to find the right circuit breaker have you ever wondered if there's an easier way to find out what breaker an outlet's on let me show you a cool tool the first thing you're going to do is you're going to plug this into the outlet and you'll see that it's lit up green i'm going to show you just how to locate it and that's where this comes in follow me this way follow me this way this panel is a mess it's not labeled correctly and that's often what we see and we don't want to just be flipping everything off because people could be on zoom calls or anything and you don't want to shut off the router so that's where this comes in so come in close no readings what do you bet it's this one right here that was it now at least we know and we can mark on the panel which outlet is which breaker"

},

{

"VideoID": "89",

"Title": "KRM Electrical Walkthrough",

"URL": "https://www.youtube.com/watch?v=iwT7WYp3gn4",

"Keyword": "Electrical construction techniques",

"Transcript": "so we're standing in 48 32 159th street in urbandale this is a krm custom home that we're building that is currently in the mechanical stages so what we're going to do today is we're going to go through and do a full electrical walkthrough with our electrician as well as the homeowner to go through all the ins and outs of everything that we've documented through plans and specs we're going to confirm all those electrical items along with having the electrician bring up other items that he sees that people put in their homes and things that people often maybe want in their homes that the homeowner hasn't selected as of this point okay so we're walking through the exterior of the home right now and our main points here are to make sure that we have all of our recess soffit lights where we want them we're doing a christmas circuit out here as well which will be able to actually have a switch inside the home for the christmas lights and then on the interior of the garage we're going through and seeing how many outlets we need in there what the lighting's going to be like and then if there's going to be any other options such as a garage heater or any other power requirements needed making sure that we have that covered our next space that we're going through here is the master suite so in the master suite we want to make sure we've got the tv location and an ethernet connection in there along with any other specialty outlets that people need to maybe charge their phones or special outlets for any other types of switches that are going to go in there in the master bath we're making sure that we've got our lighting covered what are we doing over the top of the tub in here in particular we're doing a chandelier we're also using special fans in here that really don't make any noise that have a real high cfm so with the size of this shower and the steam that'll be created that it'll help exhaust that better than just a standard fan our next space that we're going through is the whole kitchen and dining area we have glass door cabinets in some of these cabinets in the kitchen and we're making sure that we've got led backlit inside those cabinets and then going through placement of recessed can lights making sure we have enough light in that kitchen and dining area in this particular pantry we want to have a motion light so there won't actually be a switch in the pantry we'll have just a motion sensor so that when you come in the pantry the light turns on and then it'll time out after a period of time our next area of focus would be the lower level bar we've got a lot of specialty lighting going in the back cabinets that are going to be lit with led tape light and then we have some under cabinet lighting in there along with recessed cans and we've got some pendants and then through the different wreck spaces that we have and flex space in the basement making sure that we've got our tv locations in the correct spots we're using recessed cans but we're also using some sconce wall lighting as well and making sure that we've got our switches in the right locations and that everything's spaced out correctly so thanks for checking us out and taking a look at how we go through on an electrical walk-through if you have any questions or we can help you out further or you have interest in building with krm please give us a call or reach us through our website at krmcustomhomes.com"

},

{

"VideoID": "90",

"Title": "Tips &amp; tool for copper pipe joint #electrician #electrical #construction #alshaheentech",

"URL": "https://www.youtube.com/watch?v=Zb8PslDeLvA",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] oh [Music] n"

},

{

"VideoID": "91",

"Title": "WE HIT A GAS LINE! 200 AMP Electrical Panel Upgrade #electrician #electrical #electricity",

"URL": "https://www.youtube.com/watch?v=LVK2e\_cwqRA",

"Keyword": "Electrical construction techniques",

"Transcript": "we hit a gas line fire department showed up the police showed up our gas line is right there cuz sometimes they miss if you are doing underground panel upgrades you got to have one of these we started noticing sand right here so I'm pretty sure that the gas line that's right there goes right out this way it was marked out but I want to double check it we have our own underground Tracer quick tip here is this wire that's wrapped around the gas line right here this is actually a tracer wire we clamp on right here and then watch this there we go on one of the projects that we did"

},

{

"VideoID": "92",

"Title": "How to keep cable neat #electrical #1stfix #electrician #sparky #tips #howto",

"URL": "https://www.youtube.com/watch?v=RgsMgu6DSqc",

"Keyword": "Electrical construction techniques",

"Transcript": "so on this job we are using underfloor pipe Clips to clip our cables into the seller Tech easy and simple just push them in and then you can just tap it with a hammer or Cutters I think it's quite a nice neat way to keep the cables all nice and straight into the zones and it also stops the tack up from pinching the cables"

},

{

"VideoID": "95",

"Title": "Reinforcement and electrical piping of roof gutter#construction#realestate#civilengineering#trending",

"URL": "https://www.youtube.com/watch?v=iXryMNSYt8Q",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] hello welcome to my YouTube channel as you can see this is the I'm trying to show you how the that is the how the work and the piping was connected that is the the drainage pipe this is the electrical fittings electrical Works can see can see the where placed with the spacing 200 m center by center that is the electrical piping where the electrical wire pass through can it's connected [Music] got to C roof C thank you for watching my video please subscribe for more video"

},

{

"VideoID": "96",

"Title": "GFCI Fail #newhome #homeinspection #electrical #fyp",

"URL": "https://www.youtube.com/watch?v=g2Jfp0HyD0w",

"Keyword": "Electrical construction techniques",

"Transcript": "they told me that the bathrooms are not GFC protected and I figured there is no way the Builder is that stupid well I was wrong [Music] so we have no GFCI at the bathrooms this is an art fault no GFC at the exterior"

},

{

"VideoID": "99",

"Title": "COMMERCIAL ELECTRICAL MATERIALS Apprentice Electricians Should Know",

"URL": "https://www.youtube.com/watch?v=Wk\_mSDfaRTg",

"Keyword": "Electrical construction techniques",

"Transcript": "What's going on my friend this is Dustin \nStelzer with Electrician U and today we're going to talk about a whole bunch \nof different commercial materials that   you should know if you're getting \ninto commercial electrical work Alright, so there's gonna be a whole \nton of things that are not on this list I'll probably do several more of these \nvideos, but I just picked things that doing commercial I knew as an \napprentice coming in, I'm like,   \"why do I need to know that \nand what is that called?\" And why is this different than this? And I think it'll just help \ngive a foundation somewhere   to start for apprentices to start \nunderstanding what these materials do Number one is the 1900 box. So \nthis is essentially a multi-use box It's called a 1900 box because it's \ncalled a 1900 box. It's not actually   1900 of anything. That's just what it's called There's a 2100 box that's a \nlittle bit larger than this but what you do is you put a \ndevice in it so you could have a receptacle or you could have \na switch inside of here and   you bring all of your wires into \nthese knockouts around the sides you can also just use it as a junction \nbox a place to make joints and You know hide the box somewhere But you need to know in 1900 \nbox because you're gonna use   the crap out of these things. \nNext up is the industrial cover So this is an industrial cover \nit actually fits on in 1900 box So both of these together, you know you probably mount this on a wall somewhere and then you wire everything inside of the box \nput that on there looks all nice and pretty that is the industrial cover. \nNext up is the mud ring. So   there's a bunch of different size mud rings They come and different \ndepths, they come in different numbers of devices, but essentially this is very \nsimilar to an industrial cover in that you would put this on the front and \nyou could put a receptacle   in this and it allows you to put sheetrock over it So if you're actually gonna hide some \nof this behind sheetrock, you know you're gonna want to use a mud ring and this whole box is \ngoing to be recessed in the wall a little bit more Usually there's gonna be a bracket on that too. \nThat's coming up. Next up is the bracket box So this is still a 1900 box or a \nfour-square box, whatever you call it there's probably a lot of \npeople that call it a 4 x 4 x 1 there's probably 30 names for this box. But what   I call this is a 1900 bracket box \nand what it does is allows you to Stand it up on something and then screw it   in place. Normally you're gonna be \ndoing this all wall, you know like Well, I don't have a wall here so if \nthis is a stud the box screws to it But same thing 1900 box, just has brackets on it So we call it a bracket box The next box that you want to know is the gangable   box. Some people call this \na cut-in box or a pop-in box but typically you're going \nto be cutting sheetrock and sticking this inside of a \nhole into a wall and then   running wires into it and then \nhaving a device inside of here Whatever you call it,   they call it gangable because there's \nscrews here and you can actually remove these plates and you can stack multiple of   them together to make like a \nthree or a four or five or a Seven or a ten gang box if you want to Kind of a neat idea actually to be \nable to remove the sides on these But in practice, I personally think they could \nbe way better accomplished with something else These are some of the biggest pains in the butt \nto try to get in the wall. You got to cut them out just right, make sure that the ears are \nadjusted a perfect way, and you know depending on what kind of connector \nyou use in and may have to cut a   little bit bigger hole and there's just a pain in the butt to work with but you're gonna work with \nthem a lot so just know the cut in gangable box. Next up are MC connectors, so There are single MC connectors that a single \npiece of MC cable goes into The wires stick out here the sheathing \nkind of snaps and locks in place These are just two different \nstyles of snap-in connectors so you would literally just knock \none of these holes out and Snap this thing in place it locks in \nand then you run your wire into it But we call this a single barrel MC \nconnector or a single barrel connector These are double barrel connectors because you can   put two wires in them. There's a \nwhole bunch of different styles This is one that actually has a lock \nring on it. And you know, it's threaded so you would stick it into a hole and you know put the lock ring on tighten it in place. \nWhereas these ones actually snap in place It's just a matter of preference really, \nbut you're gonna run MC a lot in commercial so you need to be familiar with the \ndifferent kinds of MC connectors Alright, so next on our list \nis MC cable. You just talked   about the MC connectors. So this is MC cable Essentially it's going to be the same \nthing as romex on the inside, you know we talked about this in the \nresidential one of these videos,   but you know inside it's \njust got regular conductors It's just the sheathing that's \ndifferent this stuff rips and tears It's okay for houses Actually, you can use that \nfor commercial too depending   on your jurisdiction depending on the situation But most of the time you're going to be using   MC because it's a lot more \nrigid. It's harder to break So just understand when people say MC This is what they're talking about something that \nlooks like this. There's all different kinds of MC Just like there's a whole bunch of different kinds \nof romex. But so you can understand what MC is Here it is. Alright next \nstep for a conduit fittings So these are a couple of different \nkinds of conduit fittings all for 3/4\"   conduit or tubing depending on what you're using There's a bunch of different styles \nof these too, some of them are Rain tight so they can be used outdoors. Some   of them are just compression. \nThey fit together really tight and then there's set screw which get fastened down with a \nscrew. They're all you know,   you're gonna use all of them in \nmany different kinds of scenarios So just knowing like this is a connector Whereas this is a coupling you \nnotice there's no threading on   the couplings. They just it's \nit's a pipe in and a pipe out Whereas a connector there's actually threading on   one side that goes into a box so \nyour conduit stops at that box But just knowing conduit fittings, \ncouplings and connectors,   you're gonna hear those over and \nover again couplings - connectors Another good thing to know is the blank. So   the 1900 blank is something \nthat goes on a 1900 box and That's what you would cinch down \nafter you get wires put on this thing If you're gonna have a device again You're going to use either an industrial cover \ninstead of this or you're going to use a mud ring But if there's not a device going in it and you're \njust making up joints and pushing them in the back You're going to use a cover. \nSo either 4-square cover 1900 cover depending on what you guys call it what   area of the country you're \nin. Next up is the 12 x 12 Junction box. You're going to use a lot of these This is kind of a cool style from \nHubble or Arlington same company but they make these little stab-ins that MC goes inside of these so you just   pop these out stick your MC in \nand they already snap in place You're not going to find a lot that look like this This is something that I was just sent recently,   but it's cool because it's got \nall these different knockouts You know, you can run 1 1/4\", 1 1/2\" 3/4\", 1/2\" conduits of all \nsizes. It's got some in the back It already comes with a ground \nbus but you're gonna see boxes   that look this size where it's four inches deep By 12 inches wide by 12 inches down These are just pretty much the same \nthing as a 1900 box, just a lot bigger You can put bigger conductors You can put more conductors inside of it, but \nunderstand when somebody says that a 12 x 12 they're talking about a twelve by \ntwelve junction box. Another thing   that you're gonna come across \nin commercial a lot are relays I've got a whole different video that I've \ndone on how relays work and what they are,   but essentially just know that relays are multi-pole switches so you can put \nmultiple different things and switch certain loads on while other ones off but \nit's an electronic remotely-controlled switch So rather than somebody having to come in and   flip a light on or go and flip \nlike three different lights on somebody could hook a photocell up \nor flip one switch and it turn on   like three different things while \nit turns off some other things So it's a way to introduce a little bit of logic   to your circuits. So just know a \nrelay is an electromagnetic switch that you can switch multiple things with Alright, so I can't talk about the relay \nunless I talk about the contactor as well So a contactor is the exact same thing \nas a relay. It just handles more amperage So it's used in a little bit more beefy situations You can get them in multiple different poles. Like   this is a four-pole contactor. This is \na three-pole that is configured as a Six pole but it can be a twelve-pole Another three pole. This is a 12 pole So there's all different kinds \nof contactors that you're gonna   run into and commercial non-stop and \njust understanding that what it does Is it allows you to take one action that affects a \nwhole bunch of different circuits at the same time You can sometimes turn some of them on and \nturn some of them off at the exact same time So just again is introducing logic into a \na pretty analog circuit. Alright, next up we've got two things that are pretty \nsimilar kind of the same thing, but not spring nuts and cone nuts So spring nuts go inside of unitstrut or kindorf or strut \nchannel or whatever you call this stuff but they twist in there and it allows you to have a surface to bolt on to so it has something pushing this \nway and something pushing that way a lot of people don't like them \nbecause these little things just get in the way and then popping through the back   and falling out and just get \nin the way more than anything so cone nuts are a good alternative. I \nlove cone nuts. That's really all I use but the same thing, they push inside and They spin and just lock in place and they're nice   because you can slide them. \nThere's nothing in the back like the spring getting in the \nway. I just hate spring nuts,   but from time to time you got to use them spring nuts and cone nuts. Next up is strut, or kindorf, or cantruss or strut rack, or channel whatever There's so many different names for what this is But this is what you build racks \nout of so this is a really rigid   material usually comes in 10-foot sections Sometimes it'll come in 20 foot sections. \nSometimes it's double stacked back-to-back Sometimes it's thin strut that's only half \nthis thickness. Sometimes it's you know,   this is 1 5/8\". There's a 7/8\" strut as well but get used to what strut is and knowing \nwhat it's for you're usually using It because it's so rigid to mount things to \nyou bolt it into concrete. You can bury it put like pour fresh concrete and bury one \nof these and then when the concrete   dries you get something really \nsturdy and rigid all kinds of uses for these sometimes we \neven just use in the strap pipe We'll build a service on a wall and we'll stick   this behind our risers. So we have \nsomething to attach our riser to on, you know, the side of \na building. Next up...I'm   gonna talk about two different kinds of conduit EMT electrical metallic tubing this is \nkind of a I guess a thin walled tubing People call it conduit. It's actually a tubing It's really just in forums and really super picky people that have nothing else to do with \ntheir lives that are gonna sit and pick you apart on whether or not you're calling this \ntubing or conduit. It doesn't matter. and the other one is rigid metal conduit, so RMC this is really really thick \nstuff. I mean it is heavy duty It's really difficult to cut \nthis stuff. It's a thick walled It's galvanized. So it's just a really super stout \npiece of conduit. That will not rust or corrode I mean everything will rust and corrode after \na certain amount of time in certain conditions but this stuff lasts a really really long \ntime and it's damn near impossible to break whereas this can get crushed pretty easily Corrodes a lot easier So just knowing what the difference is like you'll \nalways be able to tell rigid when   it's brand-new on a shelf, because it \ncomes threaded and when you cut this you will have an actual threader that you can   use to stick this on like this \nend right now is not threaded But you could stick this in a threader \nand actually thread new threads on it So all of your fittings are gonna be \nthreaded. (Not all of them, there are   some that are not threaded \nor \"threadless\") couplings But EMT, you're never gonna thread you're always   going to use couplings and connectors and \nstuff to put on the ends of these things so that's the big difference but I \nthink you should know both rigid and EMT because you're gonna use both \nof them on a pretty frequent basis Alright the last one I want to cover is flex or flexible metal conduit Most people just call this flex though It's not weatherproof, it's not \nraintight so water can get in this stuff There's usually two different types that people   use, this is aluminum and you can \ntell it's just like super floppy Easy to break and then this is steel. A little bit \nharder to work with harder to cut harder to break Certain environments certain things you're doing will require one or the other or just \nwhatever you got on the truck and will work Again, it just kind of depends but knowing what \nit is. Not only that it's flexible metal conduit That's the actual name of it. But most people \nout in the field just call it metal flex or flex Alright my friends, so that's it. I mean there's \ndefinitely way more of those that I can cover and I'll probably do that again another video but I just wanted to give any of you apprentices \nor people that are about to get into commercial kind of some perspective on some of the \nmaterials that we use so...Let me know   if you have any other questions, other suggestions I love you crazy people and I \nwill see you in the next one!"

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{

"VideoID": "100",

"Title": "Construction Top Tips - Electrical Safety Tip 1",

"URL": "https://www.youtube.com/watch?v=6X5JAllzo2A",

"Keyword": "Electrical construction techniques",

"Transcript": "So a safe work method statement is required, depending on what the people are actually doing. So if a person was working on a switch board that is energized – or we’ll say has been energized – and the electrician wants to go and work on that switchboard then they need to undertake a safe work method statement to determine, firstly what is there activity that they’re about to do – so they might be going to install circuit breakers or whatever – they need to consider, we’ll what’s my hazard – and the hazard is that they could get an electric shock or they could have an arc flash and then they need to consider well what is the control? And the control would be – I need to isolate supply at that switchboard. And that doesn’t mean just turning off the main switch, because then that switchboard is still alive. So at a house they would have removed the service fuse and that would be there control device. If it is live cabling that’s running through a building, then if there is work that is going to occur in and around near that cabling that needs to be incorporated into whatever activity they may be going to do – they may be installing plaster or pipe work or duct work. So they need to consider, whatever I’m doing, does that pose a risk? Am I likely to damage this cable because the cable that’s running through a building by itself, does not pose a risk to anybody, it’s the interaction that they have with that cable and the materials that they use near that cable that ultimately are whether the person is at risk or not. So if they’re cutting into it with a saw, then yes, risk of electric shock or explosion. If they set the cable on fire, because they’re using a oxy acetylene to go and braise a copper pipe for instance, then again you could get an electric arc flash from that as well. Or even the part about, we’ve got cables running down through a metal wall and the plasterer is screwing off and puts a screw in through a cable. So, yeah they do need to consider where the cables are. Depending on who the worker is, they need to look at it and think - “Do I have an electrical risk? If I have an electrical risk, how am I going to manage that so what are my controls going to be?” So I don’t create a risk for myself or others."

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{

"VideoID": "103",

"Title": "Installing electrical cables has never been easier! #forceone #electricalinstallation #construction",

"URL": "https://www.youtube.com/watch?v=HuTI3NTSU7s",

"Keyword": "Electrical construction techniques",

"Transcript": "[Applause] [Music] [Applause] you"

},

{

"VideoID": "106",

"Title": "How to bend EMT The offset shorts #fyp #electrical #diy",

"URL": "https://www.youtube.com/watch?v=0JwBmEBSkyU",

"Keyword": "Electrical construction techniques",

"Transcript": "you're going to have been an offset on EMT and the obstruction all right now for offsets for offsets we have what we call multipliers we're going to use 30 degrees or 22 degrees that's what I recommend you use as a beginner the multiplier is two so we're going to bend here and then we're going to level it back out to sit right on top of this so in this case three and a half times two is seven what's relevant here is where you can strap your pipe before your box in this case we're gonna go three and a half because that's what this two by four is so our spacing is seven because our multiplier was two we're going for three and a half inch abstract we're going to bend this up to 30 degrees put an imaginary line there you're going to see this pipe is from it's running parallel with that 30 degree Mark so we're going to roll this conduit finish off with our foot here we're gonna pull this up and there you go"

},

{

"VideoID": "109",

"Title": "Modern Electric - Specializing in Commercial, Industrial and Public Electrical Construction Projects",

"URL": "https://www.youtube.com/watch?v=KKSKsPkVbSU",

"Keyword": "Electrical construction techniques",

"Transcript": "I am my name is Lily I'm the president of modern electrical solutions my background is in mechanical engineering and then I happen to work for another electrical contractor in town and I kind of have an idea okay now I can follow the company with minority and women always my name's Tyler Tran my background was just yeah I've worked on the constructions we came here for opportunity opportunity for miners peoples and especially on the woman too so that's why we check ok let's start open the business at the beginning only four of us and then we started growing years by years when we work with other bigger electrical contractors or general contractors they can use us as to meet their enquirer diversity goals in government-funded projects that's set us apart the only a few of us in the whole state of Minnesota's they can do quality work and union members and you know also meet all the diversity goals we can certify by all government agencies as MV e WV DB and SV to me you know I think our company's unique because you know when we get the job we bit fair price not up too high or not too low fair then when we get a project we done perfect job you know and you fish finish the perfect job so that card put you back with power partners they helped us to get all the updated information about our industry outrace and they also helped us to acquire really good skills electricians they work so hard we trust them we treat them as a family so we are like a family where the team works so they work out there they report everything's and it worked so partner is it's a big help on the way we grow if we need any answer we just pick up the phone and call and ask we are new still new in five years still learning but these are people that we learn from and help us [Music]"

},

{

"VideoID": "110",

"Title": "#shorts 🤦‍♂️#electrician #apprentice #construction #trades #MunchiesWi",

"URL": "https://www.youtube.com/watch?v=6yGv6EE7xrg",

"Keyword": "Electrical construction techniques",

"Transcript": "armadillos keep digging little holes in my backyard"

},

{

"VideoID": "112",

"Title": "Electrical Techniques (1327)",

"URL": "https://www.youtube.com/watch?v=iNdkiFSSRCI",

"Keyword": "Electrical construction techniques",

"Transcript": "- Would you like to learn a skilled trade? Let's push the power on button and get you started in a\ncareer as an electrician. Welcome to Conestoga College and the one year Electrical\nTechnique Certificate Program. This presentation will\ncover a brief overview on what you can expect as well as frequently asked\nquestions about the program. My name is Joe Gaurd and I'm an instructor in the\nElectrical Techniques program. In addition to being a 309A construction and maintenance electrician, I also hold a master's electrical license. What this ensures is that\nevery instructor here, brings a wealth of trade knowledge and experience that we pass on to you. You'll find that here in the\nElectrical Techniques Program, we emphasize job readiness techniques, real life applications, and practical trade knowledge. This two semester program, is available at both our\nBrantford and Waterloo campuses. If at any point you have any questions, now or in the future, please reach out to our\nProgram Coordinator, Keith Donnelly at\nkdonnnelly@conestogac.on.ca Under the current COVID\npandemic restrictions, we here in the Electrical\nTechniques Program, have adopted a hybrid delivery format. This program is delivered\nutilizing a combination of both on-campus practical shop classes with social distancing and home-based interactive\ntheoretical classes, utilizing the Zoom media platform. Our programs use of\nthe Zoom media platform for online home-based theoretical classes, offers students an interactive platform for learning the why. The installation skills you'll\nlearn in the shop classes, will show you the how. This course is taught by\nelectricians, for electricians. So, you know that it\nwill give you the skills and knowledge to be career ready. One of the great advantages of the Electrical Techniques Program, is that it is only a two\nsemester, eight month course. Meaning, in a very short period of time, you'll be ready to start a\ncareer as an electrician. Developing practical skills is a fundamental principle of our program. That is why we maintain a high ratio of shop time versus theoretical time. This serves for developing your intuition and deepening your\nunderstanding of the concepts and processes of being an electrician. The Electrical Techniques\nProgram is a BYOD program. What does this mean? Well, it means that you are required to bring your own device. All students entering this program must have either a laptop\nor desktop computer with reliable internet access. If you currently do not have one, the college offers special student deals through Dell, Lenovo and Microsoft. All required software will\nbe available to download at the start of the program. Where is the Electrical\nTechniques Program offered? This program is offered\nat our Brantford Campus at 175 Aviation Avenue and our Waterloo Campus\nat 108 University Avenue. Our Brantford Campus\nintake begins in January, while the Waterloo Campus\nintake begins in September. Both run for two semesters or\napproximately eight months. When I complete this\nprogram, am I an electrician? No. What you have are the skills necessary to become a successful\nelectrical apprentice. These skills will elevate\nyou above all the other electrical apprentice applicants in a highly competitive field. You still need to apply for an electrical apprentice position in the area in which you reside. The college has services\nthat can assist you in building a professional resume to ensure that you are\nready to begin your career, when you graduate from the\nElectrical Techniques Program. Does the Electrical Techniques program exempt me from any courses in the two year Electrical Technician Diploma Program? Yes. If you choose to continue your electrical post-secondary education, after the successful\ncompletion of this program, you'll be exempt from\nthe entire first semester of the two year Electrical\nTechnician Diploma Program. If you still need more\ninformation on this program or have any other questions\nthat I've not answered, please visit the link provided on the bottom of the frequently\nasked questions slide. Or reach out to the Program Coordinator, Keith Donnelly at kdonnnelly@conestogac.on.ca. Just a few of the many great reasons to pursue a career as an electrician and to come join us for next semester of the Electrical Techniques Program: Are you looking to avoid\nhuge university debt? Do you want to be career\nready in only eight months? Then this program will teach\nyou everything you need in order to land an\nelectrical apprenticeship. One of the best reasons to choose the Electrical Techniques Program, is the fantastic job outlook\nfor this trade in Ontario. Job openings for electricians,\ncontinue to rise. In addition to a steady\ndemand for their services, electricians are some of the highest paid trades people in all of Canada. Wondering what kinds of career options you will have as an electrician? What kinds of work or\nareas you could pursue after completing the\nElectrical Technicians Program? Is there more to this trade than routine wire\ninstallation and repairs? Absolutely. After you've completed the\nElectrical Techniques Program, there are a wide range of\ncareer paths open to you. It all depends on your\nindividual strengths, preferences and career goals. What kinds of environment\ndo you want to work in? Do you prefer to work\nindoors, outdoors or both? Are you especially interested\nin electronics, computers, PLCs, maybe renewable energy\nor even telecommunications? Certain paths require additional training and others are directly\nrelated to the skills you'll learn here in the\nElectrical Techniques Program, which focuses on this 309A Construction and Maintenance\nElectrical License and the 309C Rural and\nResidential Electrical License. Additional career paths would include industrial electrician, line worker, renewable energy installer, network cabling CATV specialist, or a security and fire\nalarm system installer. Whatever path you choose, let Conestoga College help power on your career as an electrician. Conestoga College and the\nElectrical Techniques Program will open the doors to\nendless career opportunities that can keep you local if you want, or send you abroad to just\nabout anywhere in the world. One thing you can be certain of is that the Electrical Techniques Program at Conestoga College\nwill give you the skills and the knowledge to be career\nready as an electrician. Because at Conestoga College, we connect life and learning. From all of the instructors in the Electrical Techniques program, we look forward to seeing\nyou this coming semester."

},

{

"VideoID": "115",

"Title": "HVAC, Plumbing and Electrical rough in. #hvac #plumbing #electrical #construction #tgp #tgphouse",

"URL": "https://www.youtube.com/watch?v=tMU-TGvsVwA",

"Keyword": "Electrical construction techniques",

"Transcript": "a bit Frosty out here this morning let's take a look inside at some of the work that's been done so we've got HVAC roughed in this is going to be for mini splits we got a bunch of Plumbing that's been roughed in got some electrical that's mostly roughed in some more Plumbing down here out in the grogs this is where the washer and dryer will be and the tankless hot water heater upstairs we got more HVAC rough-in more electrical more Plumbing all of the things here's the bathroom"

},

{

"VideoID": "116",

"Title": "Professional Interior Construction: Relocating Electrical Outlets to Cabinets with Precision",

"URL": "https://www.youtube.com/watch?v=T7sP96XThz8",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] he [Music] sh [Music] [Music]"

},

{

"VideoID": "117",

"Title": "Electrical rough in. #electrical #diy #construction #remodel",

"URL": "https://www.youtube.com/watch?v=hof2A94Wxo0",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Music] the quick"

},

{

"VideoID": "118",

"Title": "Not everyone’s got what it takes! #electrical #construction #electrician #electricalwork",

"URL": "https://www.youtube.com/watch?v=gAdZJKGsXdI",

"Keyword": "Electrical construction techniques",

"Transcript": "and she says"

},

{

"VideoID": "119",

"Title": "I hope I don’t get electrocuted 😬 #building #electrical #construction #shorts",

"URL": "https://www.youtube.com/watch?v=8gQCrJJup-I",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign [Music]"

},

{

"VideoID": "120",

"Title": "Top 5 Residential Electrical Code Violations",

"URL": "https://www.youtube.com/watch?v=Q2TXesCpHZY",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Music] welcome back to the channel my name is ronal more with PPG and if you are new to the channel come on subscribe hit that notification Bell so you'll know when these heaters are dropping today's topic all about electrical top five electrical code violations this violations that I come across every single week day in day out you're on the job so sit back relax and enjoy and I'll see you again in the next one all right we're doing an electrical final new meter there's my ground wire uh the issue is the the inner system bonding terminal bar that's for the low voltage for cable you know internet uh phone that bonding terminal bar typically is it's secure right in that area uh that one is missing that is is in the code book anyc and he also didn't secure the mask down to the meter we got one screw that's halfway pretty much out and we got one missing in the back two on the other side that are missing so that mask is not even secured down to the meter today's issue is the working space around an electrical panel let me try to get around so you can look at that but that's your your panel there that's the panel there and they chose to put this panel in a closet I don't know why but does that look like the required working space around a panel I think not it's a very very small closet that they put this 200 amp panel in for these AC condensing units make sure you check the label on these see I still run across a lot new construction all Outlets all receptacles must be tamper resistant all new receptacles all new electrical outlets must be tamper [Music] resistant this is one that I still still see a lot of that I shouldn't really um the all electrical outlets receptical outlets in the bathroom must be on the GFC circuit um one little tester here it is wired correctly you see there but when I hit my test button to see if it'll trip the GFI trips it doesn't it doesn't trip all receptical outlets and bathrooms kitchen must be on GFCI circuit kitchen laundry GFCI and afci this one is not tripping you can see I pressed the little button here and it's not tripping the bathroom brand new [Music] home [Music]"

},

{

"VideoID": "122",

"Title": "how to#work #electrician #electrical #electricity #diy #howto #construction #electric #engineering",

"URL": "https://www.youtube.com/watch?v=a-Xuwuy1TbY",

"Keyword": "Electrical construction techniques",

"Transcript": "what's up guys it's your boy kix and i'm gonna explain real quick how to use a breaker finder first take your breaker finder the dingus and stick it in your outlet and scan the panel twice because sometimes you might get a false positive all right and with that we've confirmed that the breaker is off um that's how you find a outlet that does not have a label to a breaker peace out guys"

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{

"VideoID": "123",

"Title": "electrical conduit pipe fitting 💯😀 #electrical #construction #shorts",

"URL": "https://www.youtube.com/watch?v=4DfW1mzlsCY",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] n [Music] n [Music] [Music]"

},

{

"VideoID": "124",

"Title": "A good electrical panel? #thataintright #homeinspection #newconstruction #warranty #fyp #viral",

"URL": "https://www.youtube.com/watch?v=rT5olFCZlLs",

"Keyword": "Electrical construction techniques",

"Transcript": "all right Trey we go to our inspections remember like the content like follow share y'all know I'm a Texan right you know a lot of cowboys you see the movie yo it's just a hat it's just I guess it's just a text thing let me show you what we're looking at all right guys it's an electrical panel yes that's what it is but this is a good video this is a warranty inspection almost a year and guess what they got the surge protector they got arc fault breakers and guess what they got the protections for the lug covers it ain't rocket science just come on this is all this is over almost a year so when I'm looking at homes that's new today that don't have those things that ain't right they go to texting thing yeah you're right"

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{

"VideoID": "125",

"Title": "How to Conduct a Rough Electrical Inspection | This Old House",

"URL": "https://www.youtube.com/watch?v=5PGjJHIFV6w",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] our electrician alan gallant has called for an inspection come on now so i've called alex berube the wine inspector here in the town of lexington nice to meet you so in the past i've had homeowners ask me to do electrical work without a permit absolutely not you won't alex's job is to protect the homeowner protect us from what alex not protect us from fire uh shoddy workmanship and also proper mechanical execution of the work all right so we're looking at a wall right here there's going to be a counter with cabinets underneath let's start here what are you looking for sure well our wall starts here so you typically want an outlet within two feet of that break so location of boxes is one thing absolutely two feet two feet and then you're going to be looking every four feet thereafter huh and what sort of dictates that spacing is this the extension cord uh well if you put an appliance right here such as a coffee maker the cord is a two foot cord can plug into either outlet without an extension cord nice extension cord is generally a bad idea bad idea okay so these boxes are properly placed they are all right and the other thing too that we're looking at too is inside the boxes you get a metal box here you want to make sure that it is properly grounded and all the terminations are done properly and it is it is yup nice job out so we've got wires running all up the walls through the ceiling when i walked into this room this was the wall that caught my eye because it looks like everything electrical is going on this bank right here has got a ton of wires can you tell us what the different color wires are for sure the white is 14 2 which is good for 15 amps your yellow is a 12 2 which is good for 20 amps and then your orange is good for 30 amps which is your 10 3 so small medium and large correct and this would be used for what just regular outlets yeah regular outlets and lighting in the house and this one usually appliances within the kitchen such as a coffee maker a microwave and then the big daddy you're probably looking at a dryer ah okay all right so they're all there what do you want to see as an inspector i just want to make sure that it's properly stapled neat and workman-like and then which it is what is proper stapling well you're going to have a staple within 8 inches of a box or 12 inches depending on the connection of the box and then every four and a half feet after so four and a half feet so you over staple allen we tend to overstable kevin and here's the actual staples we use you can see one is red and one is blue yeah the red is actually used for two cables and the blue is only for one cable oh i see and another thing you'll notice down below here we're using nail plates and that's a physical protection you know the sheet rocket comes in they're looking to go quick they're not looking for wires you know they're driving into your wire and next you know you have a problem with finish so that's why we use the nail plates you know the sheetrockers don't like you either pal that's okay okay so this wall looks pretty good it does look fine yep all right so we've got the location of the boxes we've got the wires we've got lights up here in the ceiling uh we've got some recessed and now what are the pendants two pendants over the island here correct all right alex what are you looking for i'm making sure that the boxes are properly grounded and they also have a proper mechanical connection to the box right now the wire is going through the button connector a button connector being what let me show you here kevin you see it in the center of our metal blocks which we in turn take a romex and sleeve it through like so and now you can see it's nice and tight oh look at that okay so just like the staple we want to make sure that these wires don't pull or tug and that's not coming out of the box correct also protects the wire too from chafing from the metal box so that's what you're looking for up in the ceiling they're all in place they are all in place all right so at the rough electrical stage uh you're gonna sign off absolutely so we did all right very well nice job guys thanks thanks for watching this whole house has got a video for just about every home improvement project so be sure to check out the others and if you like what you see click on the subscribe button to make sure that you get our newest videos right in your feed"

},

{

"VideoID": "127",

"Title": "Awesome Electrical Boxes ⚡#shorts #electrical #diy",

"URL": "https://www.youtube.com/watch?v=\_XkcMNC3Gis",

"Keyword": "Electrical construction techniques",

"Transcript": "So I have a really old outlet out here. As you can see, this is some green\nasbestos siding called infill brick. And I want to put a new box in. So one of these things are tremendous\nbecause it has a flange around it\nto allow your siding the slide into and it already has the box\nand everything ready to go with it. So if we're going to change out\nthis outside light or outside outlet and put it in a GFCI outlet,\nlet's get rid of this, see what we're getting into\nand hopefully it goes all right. Okay, got a new wire."

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"VideoID": "128",

"Title": "Should you pigtail your electrical outlets? The answer might surprise you.",

"URL": "https://www.youtube.com/watch?v=K3RIjUnrNTQ",

"Keyword": "Electrical construction techniques",

"Transcript": "should you pigtail or through wire your electrical outlets in this video i'll share my thoughts on the subject and also show you a great time saving trick for whichever method you decide to use so if you're not an electrician let me show you what i'm talking about a through wire connection like this one uses a device to connect the downstream load for example your current comes in on this black wire so you're depending on this terminal connection this little tab here which connects this side to this side and then this terminal connection which feeds your downstream load so these two connections and this little tab are what's going to carry the current for anything downstream on this circuit and of course the same holds true for the neutral side as well now there's only one terminal screw for the ground so the ground wires will be pigtailed no matter which method you use on this pigtail circuit we're using wire connectors to connect the incoming circuit to the downstream load with tails that come out and connect to the device so in this case the device does not carry any downstream load believe it or not this is a highly debated subject among electricians now you have group one that says always pigtail there's no exceptions and group two will say no you never pigtail you don't need to do that now i should note that both methods are nfpa 70 code compliant so unless your local code is different it really comes down to you or the engineer to make the decision on which way you decide to go so what are some of the arguments group 1 will tell you that you should never depend on the device to carry the downstream load but did you know that the pass-through current rating is 20 amps even on 15 amp receptacles like this one so the receptacles are actually designed to carry the circuit load this is why the code allows you to put 15 amp receptacles on a 20 amp circuit look for that video up next they also say that pigtails make things much easier to troubleshoot because a failure would be isolated to just the one device now this is true but wouldn't a wire connector also be a possible failure point that would affect the rest of the circuit now group two says now it adds more wire to the box adds a possible failure point it's it's just more work now these are all really good arguments but isn't there still a time when pigtails are the best or only option so who's right well in my opinion it depends on the application i think there are four applications where pigtails are the best option now if you're someone who uses the back stab quick connects on your devices which i don't recommend i would say always pigtail because additional load can cause these to fail over time when you have more than two cables entering the box contractor grade receptacles only have two connection points without using the back stabs while commercial grade actually have four but i believe having more than two cables connected to the device is not a best practice and i'll always pigtail in this application if you're working on an existing installation where the wires in the box are just too short many older homes will have short wires which will need to be extended in order to make a safe connection to a new device in this case pigtails may be the best or only option if you have a gfci or an afci receptacle that won't be protecting the downstream load in other words if you're not going to hook the downstream wires on the load side of that receptacle then you'd have no other option but the pigtail in this situation now there are also multi-wire branch circuits which require a pigtail but there's a lot of other requirements around that as well so i'm going to save that for another video so that's just my opinion but hey john i thought you promised us a time saving electrical rough-in tip well i'll show you that right now so whether i'm going to through wire or pigtail i always like to leave one cable long about 12 inches while the other one is about 6 inches long the reason for this is i'll have this extra wire so that i can run my continuous ground to the device but also if i'm going to pigtail i can cut my hot and neutral tails out of this as well so i'll just strip this out and fold it into the box and then when it comes time to make up the device i'll have all the wire that i need right here waiting for me so if you enjoyed this video hit that like button down below and if you want to learn more electrical tips and tricks check out these videos next thanks for watching [Music] you"

},

{

"VideoID": "129",

"Title": "New home electrical wiring ideas | How to Properly Twist Wires in a Switchboard | Perfect Wire Twis",

"URL": "https://www.youtube.com/watch?v=H0DHcvtvF4g",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] tell"

},

{

"VideoID": "133",

"Title": "DID YOU KNOW? Electrical Plans.",

"URL": "https://www.youtube.com/watch?v=kA3sOvjOTW4",

"Keyword": "Electrical construction techniques",

"Transcript": "did you know that when you have your plans drawn by a draftsman architect or design build firm they need to show where all the electrical is going to go and you don't want to leave anything out most contractors build to what the plans say and all building plans have to have some sort of electrical plan so you want to make sure that that outlet for the TV the can lights that you want for reading lights above the bed or the wall sconces above the bed you want to have all that specifically named out and shown in the electrical plan with what you want separately switched all that stuff that electrical function needs to be shown in the plan otherwise you're probably not going to get the electrical that you want so make sure it's on the plans so that the roughing goes exactly per your dream"

},

{

"VideoID": "136",

"Title": "Wire-Stripping Tips for Roughing an Electrical Box",

"URL": "https://www.youtube.com/watch?v=LcVpfAt3hGM",

"Keyword": "Electrical construction techniques",

"Transcript": "to get the insulation off of this wire so we can get to the conductor's inside easiest way to avoid cutting yourself and or scoring the wire on the inside is to get about an inch and a half of what you got sticking out of the box and just stab into it with a utility knife and cut away from you once you're there you can expose the conductors on the inside and just pull it back the other advantage to only scoring the first inch and a half of this is that we've got more than enough wire here to do what we need to do in this box so even if I scrape the wire sheathing on the inside it's not going to matter cuz it's going to get cut away when we roughed in The Wire we labeled everything so we knew what it was now that we've cut off all our labels I just set them back where the wire enters the box so they're ready for me when I've got the conductors exposed now that we've got our sheathing back and we left about a/ an inch in here to make sure we have our 1/4 in minimum we're going to take our Cutters and just clip off the remaining sheathing I like these as opposed to a utility knife for this so that I don't accidentally Nick that sheathing on the conductor itself"

},

{

"VideoID": "138",

"Title": "Demo finds #1 #electrician #electrical #construction #demo #diy #fail",

"URL": "https://www.youtube.com/watch?v=Ak13qY7X2MQ",

"Keyword": "Electrical construction techniques",

"Transcript": "holy jesus what is that what the [ \_\_ ] is that"

},

{

"VideoID": "139",

"Title": "The Power of Prefabrication: Streamlining Electrical Construction Processes and Timelines",

"URL": "https://www.youtube.com/watch?v=MwYtypea7kQ",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] ask any track star and they'll tell you that speed is the key to winning the race [Music] ask any construction professional and they'll tell you that speed is more of a consideration today than it ever has been in the past [Music] but what options does a contractor have when faced with the demanding schedule can we just move quicker train harder like a track star yeah we can if we could take a portion of the work from the job site into a controlled warehouse and did the work there well then we could save time and money for our customers anytime you can take work out of the field and put it in put it in the shop where it's a more controlled environment we're all going to be better off we'll take the engineering team's layout and then we integrate that into our model and make sure that our model works with all the other trades and then once that's completed then we push that information that data into our production and they'll fabricate it up and get it out to the site once you've figured out prefab a lot of mistakes in the early years where they get it to the job site and things weren't fitting properly sequoia as much as anybody is fine tune that to a craft most traditional design engineering is done in 3d what we do we see it in 5d three dimensions that ueb used for generating drawings or bim modeling cost is the fourth d and fifth d is scheduling having that that allows us to bring a lot of activities up front and we start working on the job while we're still finishing drawings and not impacting the outcome but don't just take our word that prefabrication can increase the speed at which projects are built let's see it in action on an apartment complex in the south lake union neighborhood of downtown seattle a job where you're dealing with multiple units that's repeated is where fabrication really can succeed very well because it's it's the same object that you can you can mass produce and put it in you know repetitively as you go that apartment unit that flow that parade of trades once it starts that train keeps moving right so you really have to pre-plan and on this job it was a little even more unique because the podium level had three floors of 28 units so we had 84 units in the first three floors so that was coming back here getting with austin starting even sooner than we maybe thought we would have making sure our engineering's in alignment on down the road into our modeling into our assemblies so it was an opportunity to go okay we've done it before now we're going to do it all in-house and now let's start even earlier so we can hit the ground running anything from conduit bends welding racks welding transformer stands one line panels transformers load centers strut racks temp power that all comes out of the osp number one shop as the old adage goes time is money and money talks panel is coming out with boxes on top it's really easy to slap it on the wall and bring the box on top all the wires are pre-made up same with the lights we had the lights for elevator shaft had a 90 on with the box easy to slap it in but overall i think prefab saves a lot of time in the field anytime you're working in a controlled environment like we have here you're taking weather out you're taking safety risks out you're taking noise all the other distractions out of them and giving everybody that all the tools and parts they need to work efficiently right now we're pretty much done with the tower we just pulled the tower crane out so we've got a couple build back units we're doing we're scheduled to finish in february so i'm here four months from now we roughed in all the way up and then i started hopping around right now i'm working uh tying up the parking garage doing exit signs and kind of some loose ends just last minute things it's about supporting the entire local all the teams and making sure we can continue to get work you know as we go forward in the market the markets are changing it's how we're just staying competitive so i do see that prefab is that next step that that we're taking sequoia's done great they do a great job it starts from the top with with our the pm that they have and the general foreman it's important that our electrical sub lead the effort and others follow behind them and so yeah sequoia has done well for us and done well for on this project clients they want information they want information the sooner they can find information the better the decision can they can make and once you do and you build that trust that you have the expertise to deliver that product that's pretty powerful so if you're faced with a project that's deadlines seem unreachable whether you're an owner a developer city manager or a gc look no further than your local nika ibew powering america team from seattle for electric tv i'm dominating"

},

{

"VideoID": "140",

"Title": "see This unique electrician tool #shorts #fyp #electrical",

"URL": "https://www.youtube.com/watch?v=uengyfCoz1c",

"Keyword": "Electrical construction techniques",

"Transcript": "got the u6v checkpoint electrician level checkpoint makes some of the best electricians levels available this one seems like it's no exception let's check it out first off someone would say you've only got one level vial how is this useful look you got 45 22 30 and 60 but first let's check out the magnets because the magnets are closer to the metal we can probably pick up this Bender yeah that is really strong magnets all right let's talk about the magic of this level if we want an offset for 22.5 degrees you can see as we Bend up that this bubble is going to get level there you go there's 22. if you want 45 simply rock it down keep bending and you can see look now we're at 45 degrees check this out you can get this on Amazon it's called the checkpoint uv6 thanks for watching except for more and that's why I'm glad that I"

},

{

"VideoID": "141",

"Title": "DIY Hack, Heat Shrink Connectors - Where were you 20 years ago? #electrical #diy #handyman",

"URL": "https://www.youtube.com/watch?v=GMP\_cFJg-yM",

"Keyword": "Electrical construction techniques",

"Transcript": "quick tips for the DIY we should come across these ages ago on Amazon they replaced the soldering iron and the difficulty of holding all those little extra wires all you do is you take your two eyes and you slide them through and line them up with that little silver solder area you heat gun it for about 60 seconds and this is what you get you get difficulty in pulling them apart it works amazingly quick wish I found it years ago"

},

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"VideoID": "142",

"Title": "How EVs &amp; Prefab Are Impacting Electrical Construction | The Power of Better | EP 1",

"URL": "https://www.youtube.com/watch?v=uyRPH9-F4L8",

"Keyword": "Electrical construction techniques",

"Transcript": "thank you [Applause] hello everyone and welcome to the very first episode of The Power of better I'm Albert Walters III executive director for powering Chicago Parr in Chicago is a unique partnership between the International Brotherhood of Electrical Workers Local 134 electricians and the electrical contractors Association of Chicago and Cook County where we are supported by three foundational pillars better construction better careers and better communities the purpose of the power of better is to share knowledge about the latest practices and technological advances being utilized in the electrical construction industry today perhaps nothing has changed the electrical industry in recent years more than prefabrication prefab increases job speed and accuracy by building essential electrical construction components off-site for efficient and cost-effective installations on the job site we are here at one of our signatory electrical contractors Continental electric located in Berkeley where we came to learn more about the growing practice of prefab and how it can benefit your company too Continental electric companies 40 000 square foot Warehouse buses with activity on a daily basis but it is how they're doing their business that is setting them apart pre-fabrication or prefab allows them to properly measure and account for all materials so that when they get to the job site the contractor has everything that they need nothing more nothing less this shift in the way that Continental does business was pushed by its owner David witz nearly 20 years ago and it is really paid dividends but I also saw that this is the way of the future and that it was a true I would not necessarily innovation in the industry but it was a a change that was coming and something we had to embrace and get started with because the major thing that they also expressed is it's a cultural shift for your business what this means for Continental electric company is that they are building everything off-site then shipping it to the job site using lean principles more efficient cleaner and leaner as their director of field operations knows because the clients demand it so basically the lean principles are are at coming to the site for installation uh with minimal garbage or anything going uh you know to the landfills from the general contractor so just how does Continental know how to build things exactly to spec that's where prefab manager Jim Gilman comes in using computer generated Graphics called Bim or building information modeling to make sure that they are sending out the exact specifications for the client which can at times dramatically reduce the time it takes to do a job from two to three weeks to just one to two days because of that Bim modeling capability that's really pushing the envelope now and there's really no end to what we can or can't do in terms of fabrication here this facility is set up for that it's streamlined for it we have we have Innovative processes here internally that allow us to do things the non-traditional way for prefab and Bim expert Josh Boone the executive director for electry international the benefits of this kind of investment and commitment is a win-win for the manufacturers and the clients there's a number of things that prefab does for us that it's the industrialization of construction we're starting to have more efficiency and productivity now you're diverting a lot of those labor hours off the job site too to build a safer work environment that can help lower your insurance cost there are so many things that it can really start to dial in end users and general contractors like Justin Brown of skinder construction are True Believers in the prefab movement seeing how all of these benefits help provide a superior on-time and on-budget project for customers you know to make us all better in the industry specifically here in Chicago to utilize pre-fabrication to keep moving the chains forward on it'll make us all better as general contractors other trade Partners including electricians you know the trade partners and just continue to push ourselves you know all boats rise and a rising tide and we can all be better while prefab is the Hot Topic in the electrical industry so too is the subject of electric vehicles with gas prices soaring and fuel efficiency and sustainability top of mind for many the demand for electric vehicles is skyrocketing but that demand will only be met if customers can get the charging stations installed for their vehicles in their homes and their businesses or wherever they may be that's where Parr in Chicago comes in we quite literally are leading the charge to install the much needed charging stations around Chicago and Cook County partnering with all the key players to make sure that the electric vehicle Revolution continues its momentum because of America's focus on sustainable energy and fuel efficiency driven in part by astronomical gas prices Americans are taking a close look at electric vehicles or EVS but to meet the electric vehicle demand there will need to be major infrastructure upgrades to ensure that there are enough EV charging stations that's where powering Chicago is charged and ready for individuals pondering the move it means having powering Chicago electricians install a basic level 1 charger in your home you may be limited by the capacity you have of your electrical service but if that's not a constraint what you're really looking at now is your charge times and most EV drivers do not have to replenish that battery from zero all the way to full charge there's a lot at stake here not only meeting the demand of a dramatic change in how and what vehicles are driven but making sure Illinois Taps into 7.5 billion dollars for the national charging Network Illinois qualifies for 149 million dollars in the infrastructure bill for this purpose over the next five years and will be competing for an additional two and a half billion dollars so the hope is when charging stations are being installed at Office Buildings apartment buildings public transportation facilities private garages or car dealerships those managers hire well-versed licensed signatory contractors and their well-trained ibw Union electricians I think knowledge is key obviously we want to communicate with a vendor that had the knowledge and then of course efficiency and timing and we accomplished all those goals take Ziegler Buick GMC of Lincolnwood for example it had an immediate need for a charging station because of the shiny new electric Hummers that just showed up in their inventory to ensure that the job was done right Ziegler hired chicago-based Jameson imbalance electrical contractors which is seeing a dramatic increase in the EV charging station installations that they are being hired to do we hope that as we do with all our projects that once we've opened the door to a customer that we stay with that customer it's one of our key philosophies this process requires Jamison imbalance project manager Gina Dooley to conduct site surveys to determine a client's exact specifications for Ziegler it means installing this 480 volt charger a level 3 charger currently the fastest on the market however for other customers who may not have the electric load capacity it may mean outfitting them with a much slower level 2 120 volt charger with a Transformer the level threes are fast Chargers a level two is like a trickle charger it takes up to 16 hours to charge a battery from zero to full on the level two Chargers maybe 12 hours with these changing and burgeoning electrical needs it will be imperative that Illinois's biggest utility is ready to provide ample electricity to address them but leaders at Commonwealth Edison know the process will be painstaking and lengthy and may take years to fully execute it can be anything from six months for a very small project it just requires switching to 24 months or more depending on Transformers that you have to put in or line extensions that you have to do we also want people to understand that it's not an overnight thing it doesn't it doesn't work to just flip the switch and turn them on imagine having to install multiple charging stations with separate panels for each one to make sure Ziegler's multiple EV brands have on-site capability a lot of times logistically or even these buildings are built for service Vehicles they don't leave us a lot of electrical room for a lot of their electrical costs so you got to find the proper location for the distribution panel as for dealers like Ziegler Buick GMC it's about beginning to meet the need of the electric vehicle Revolution and with a million Vehicles estimated to be on Illinois roadways by 2030. that demand will only increase having an EV charger on site is going to help us retain the relationships that we have built with our customers not just during the sales process we invite them back for service as well if these dealers and these customers and people that are buying these vehicles don't have the Chargers they're not going to be able to use a vehicle you know these dealers need to charge these vehicles so that they can show them and the demand is is there and it's only going to grow if you're interested in learning more about prefab or electric vehicles including our EV ebook the power in Chicago created go to poweringchicago.com and that will do it for our first episode of The Power of better I'm your host Albert Walters III we'd like to give a special thanks to everyone here at Continental electric for the cooperation on this project thanks so much for joining us and we'll see you again next time [Applause]"

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"VideoID": "144",

"Title": "Power tools #construction #electrician ##electrical #electricalwork #housewiring",

"URL": "https://www.youtube.com/watch?v=dJJiTQXBO0Y",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] all my brothers [Music]"

},

{

"VideoID": "147",

"Title": "Meet the Team: Kevin Evans, Electrical Construction Manager",

"URL": "https://www.youtube.com/watch?v=rwP1USCCA5o",

"Keyword": "Electrical construction techniques",

"Transcript": "My name is Kevin Evans, I'm an Electrical \nConstruction Manager with Blue Ridge. My   duties right now are geared more towards being \na Construction Manager. Basically, we take a piece   of ground all the way from inception from when \nthey buy it. We clear the property, do what we   need to do to get it on a grade, install all the \nmechanical work, all the piles, the torque tubes   and modules. And then the electrical crews come in, \ndo all the underground wiring, above ground wiring,   make all the connections, connect everything to \nthe grid. These are transmission sites here. We   also do distribution and generation sites, but the \ntransmission sites have a substation as you can   see beside me here. So we get everything tied in \nand make sure everything's working, and then we   get to the point where we can flip the switch, \nwhich is actually what we're doing here today.   We're energizing our GSU today. It's 140,000 volt \npower line behind me we're tied into. So we're   going to be back-feeding from Santee Cooper into \nus today, and then get ready to start importing   power from our solar farm and then exporting it \nout to the grid. What I really like about solar is   the Improvement in their processes and the \nimprovement in the equipment especially. When   I first started 10 years ago, we were installing \n85-90 watt panels and thought we were setting the   world on fire. Today, we're installing 550 watt \npanels. It's in the same size footprint, just a   little bit larger, but still basically the same \nfootprint. So they've came a long ways over the   last 10 years especially. And over the last two \nyears I see some huge improvements, so I just   can't wait to see what the next five years is \ngoing to bring. It's just going to be amazing."

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"VideoID": "148",

"Title": "Episode 35 - Day 1 of Your Electrical Career - How To Be A Great Apprentice",

"URL": "https://www.youtube.com/watch?v=NGZ92nAdws4",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] what's up y'all this is Dustin from journey to master and I wanted to do an episode explicitly talking to people that were that are thinking about joining an apprenticeship and getting into the electrical industry I get so many comments from people most of the time they're the same thing do you really think this is a good idea to be an electrician and how do I get into it and I've already done videos on them so I but but I think that people want like a little bit more information about it because of the volume of people that are saying like [ \_\_ ] yeah dude I'm sold I'm going in or you know like thanks for the video I started three months ago and this is [ \_\_ ] awesome but like how do I be a good apprentice you know like what what does it entail being a being an apprentice and what do you go through so I just wanted to do a video that talks explicitly to the green guys the new guys the guys thinking about getting into this so first of all you're gonna hear a term interchangeably used constantly helper and apprentice is a helper in you know Texas most the time we call them helpers apprentice is the license you have but you're really thought of as somebody that's helping the journeyman are helping the master that you're working with your job is solely to anticipate need so think about that term anticipate need a good imprint Asst is constantly anticipating the guys around him and trying to figure out what they need next so that they can have [ \_\_ ] ready for these guys so you really have to spend a lot of time watching the guys around you the worst [ \_\_ ] thing in the world is to have an apprentice that's sitting there on his phone and he's got your buds in all the time and you can't ever like you're yelling at him and he's not hearing you and it's like dude [ \_\_ ] get off your goddamn phone like you're not here to talk on the phone you're not here to [ \_\_ ] around like you're here to work if I'm working you should be working so that's my first big big thing the other thing is work your ass off when you're there try to soak up every bit of knowledge ask every kind of question you could imagine you're gonna be thrown into so many environments in the first year that you have no [ \_\_ ] clue what's going on and you feel stupid kind of standing around you don't want to stand around but you don't want to just go pick something up and start doing something just because I'll probably get yelled at for it but just ask a lot of questions and ask the guys when you get there be like how can I help you what do you need me to do what can I do to make your job easier there's going to be some companies that the way they approach helpers is they the journeyman does everything and the apprentice all it all he does is just go back and forth to the truck and get [ \_\_ ] all the time for a while but that's needed man because the journeyman knows what he's doing and for him to do his job more efficiently and faster instead of him having to get down and go to the truck and get something and stop what he's doing you a journeyman will get into a groove and when he's doing something repetitively over and over he's listening to music he's just in this zone and to have somebody that can run and get [ \_\_ ] constantly for him makes the entire job go much faster and then when you've got a job where like there's one journeyman and like five apprentices or five helpers that happens quite a bit too but having all of these people be able to help you that you can delegate tasks to is really crucial at first you're not going to be doing anything that's really that important you know like if you get into a a residential setting and your wiring homes they might just have you go around and nail up boxes they'll tell you how to do one and they'll have you do 300 of them and it may seem boring at first but that's the point of doing that is to get you exposure to the same thing over and over and over and over and over and over so it locks in your muscle memory and how to use your tools and it locks in your brain how to do these things correctly so you may be putting 300 plugs in before you ever put a switch in you know you may be only running or like drilling holes and running wire from this plug to this plug to this plug to this plug you may do a lot of that for a while but the the better you become at it faster and the more questions you ask and the more you seem like a really hard worker and that you're driven to learn this [ \_\_ ] and that you've volunteered for things like if you see a journeyman picking up something just be like hey man let me do that I know how to do that you know let me let me try to mess around with the panel after you've been doing this for a little while you know like if you're just if you see guys doing stuff don't be annoying and ask at the wrong times you know but like if you're sitting in the truck and you're driving for an hour pick that journeyman's brain man like how do how do transformers work in what is three-phase power versus single-phase power like why they call it single-phase if there's two hots and they call it three-phase for three hots and you know like just just start asking questions think of [ \_\_ ] that makes you curious and start asking lots and lots of questions but know that you're not there as like a crucial member you're there to help you're there to to help and while you're helping you're soaking up everything around you and I would watch how different journeyman and different masters around you do things you're gonna come across you know you'll have to work with journeyman a for like a week and then the week after you're gonna go work with journeyman B for like three weeks and they do [ \_\_ ] completely opposite and you're like but what the [ \_\_ ] you know like this guy's been telling me to do this and now I'm getting yelled at from doing that that's gonna happen a lot everywhere you go every company you go because everybody does things differently and it's okay everybody has different reasons for doing things differently like one guy does something really efficiently if he does it this way and the other guy you know does things really neat and he likes to do it this way and some guys are just really fast and they just slam [ \_\_ ] together but speed because of the kind of jobs that they're doing speed is more important than like taking your time and being really methodical with everything but while you're doing all of this as you're coming up as an apprentice you know you're in your first year you're in your second year you start to see all of these different ways of doing things and you start you should start adopting your own way and however you do it as long as it's you know to code and it's good and you look at your work and you're like [ \_\_ ] yeah that is awesome that's some good work that I just did do the same thing and do it that way every time for the rest of your career you know like if you if you go and you're you twisting joints together you know and you do like seven twists and you like to have like the first three inches of the wire twisted and your joint twisted you know like do that every single time the rest of your career and the more that you can get consistent at the way you do things the less problems that you're gonna have in the future because you're developing muscle memory and you're developing you know just just this like not even needing to look at things because it's just a part of you you know like my tools I don't even look at my tool belt anymore like I can reach down and know where everything is I can reach down and grab a tool do something throw it back and reach down and grab another tool I just have built up that muscle memory over doing this for so many years so some other things that are that are appreciated when you're an apprentice that's it's appreciated by us guys that are gonna be using you all show up on time every day like a lot of apprentices tend to be younger guys new to the workforce and shown up like 60 miles an hour through the drum place slidin in four minutes late for work or showing up 15 minutes for late for work all the time that shit's not gonna fly man like in this trade all of the guys on a job depend on each other and the more cohesive you can be as a team the better it's gonna be the more that guys whereas each other and give each other [ \_\_ ] joke around like it all builds this bond between all of y'all and don't you know if somebody yells at you for doing something don't be like awful [ \_\_ ] just I don't want to do this anymore man it's part of it you know like you're not working with groomed fingernails in an office environment where everybody has to be politically correct and deal with ambiguity and no dude this is your swing and [ \_\_ ] hammers and then [ \_\_ ] falling from ceilings and there's electricity that's hot and you know if you drop something on somebody's head it could shut the [ \_\_ ] out of them right you know like this is an environment where you really got to pay attention and be there like like focus and be there all the time don't be at home thinking about you know your your girlfriend the fight you guys had while you're at work because you're not going to be paying attention you can [ \_\_ ] get somebody killed so that's just one you know aspect of all of this but again your job is to anticipate needs so you're gonna be you're going to you're going to climb above the other apprentices the other helpers if you're the guy that all the other journeyman want to have with them and the way that you're gonna be that guys not being the cool guy that says all the funny jokes you're gonna be the guy that busts his [ \_\_ ] ass and gets it you know like you see a guy go up on a ladder you see like oh [ \_\_ ] he's gonna start putting that pipe together and I don't see any connectors around him I don't even see his drill so I'm gonna [ \_\_ ] go grab his drill his connectors even if he doesn't need them [ \_\_ ] it you know like I'm just gonna get everything that I think that he's gonna need because the second he asks for it I want to be like boom here it is you know like that's what makes a good an apprentice and those kind of guys tend to get more attention from all of the other journeyman and the masters because they're the ones that they want to have around they get it they get the work ethic and they get the speed and they get the efficiency and they're asking all kinds of questions and you can just tell they're hungry so that it's like you know doing this for 10 years I can't tell you how many [ \_\_ ] helpers I've had how many apprentices that have worked out have not worked out but I usually give my all like I dumped my knowledge onto them and whatever pace I think that they're capable of adhering to that and it's few and far between that you get one that's just like stands out that's like [ \_\_ ] yeah man this guy's gonna work out like he's I can see him being a master electrician some day and those are the guys that you really want to keep dumping your knowledge into if you see some guy that's just like a [ \_\_ ] idiot and just doesn't get it and he's lazy and you know it's just like for lack of better term it just doesn't get it journeyman and masters know what I mean by that there's guys that just don't [ \_\_ ] get it and you can tell right away that they're not going to work out so we don't want to put much time and effort into them we know that they're just going to be a day laborer they're probably going to last for three months and be [ \_\_ ] gone so just don't be that guy what else do I have don't be late for work bust your ass all the time ask a whole lot of questions tools I have a video on my electrician you channel that talks about elect apprentice tools you want to get a good set of tools tools can kind of be expensive in this trade but they're really bomb ask tools and if you're gonna do this for a long time like investing in tools and you know every paycheck you get like throw twenty bucks in an envelope and the top of your closet and just write total fund on it you're gonna constantly be buying tools not like you know hundreds of dollars of tools a month or anything like that but if you buy yourself a new you know like badass 11 inch flat head screwdriver one month or you buy like a new kind of strippers another month or something like that like keep up with your tools and get good tools climb que el ein is a great brand most guys use klein so anything that you can buy of klein is going to be great there's one called nip x i don't even know it might be kinetics it might be night x its k ni PE x it's their german made but they're outstanding tools and i've heard every [ \_\_ ] person say different ways how to pronounce it but that's another really great brand commercial electric your shit's gonna break constantly you're gonna be doing [ \_\_ ] with needlenose and the [ \_\_ ] tips are gonna break off or you know your your dykes are gonna be like you're just gonna fall apart or some dumb [ \_\_ ] like they're just low made tools I wouldn't buy anything like cobalt screwdrivers Milwaukee seems to be stepping up their game lately so Milwaukee has come out with a lot of electrical tools a lot of them are not explicitly electrical rated you know so for like dealing with hot wires and stuff like that they're not they haven't always been designed for electricians but they're starting to come out with more stuff and they're actually not that bad still gotta go Klein's at the top south wire has you know it's a wire company they make wire but they've started becoming a Tool Company and so they're trying to make all these tools but my opinion is that I always trust tools that have been tools for a long time you know like Klein's been making [ \_\_ ] for like a [ \_\_ ] hundred years or something like that you know like they have been making these same tools for a century they haven't been a wire maker in the last five years they're starting to perfect the tool game you know their duels are [ \_\_ ] they're wire guys just stick to making wires stay in your [ \_\_ ] lane that's my opinion about the tools milwaukee's always made tools they've always made pretty good like drills and you know stuff like that but recently they're getting into the electrical game but they've got a lot of money and like engineers and they've at least been in the trades long enough that I think that the stuff that they're putting out is worth looking into I got a couple Milwaukee things but it's usually because like somebody gave me in the walkie tool and I just threw it in my bag because I keep two or three sets of every [ \_\_ ] tool that I can case one breaks you got another one or if a helper forgets it's [ \_\_ ] tools one day you've got an extra set for his lazy ass but yeah anyways just get good tools invest in a good drill you don't want a shitty craftsman drill or some you know like [ \_\_ ] 13 your whole 13 year old drill with a battery that's like this big you know like get a lithium-ion you know 24 volt or 18 volt or 12 volt to like a modern good Makita Milwaukee rigid those are really my top 3 maketo Milwaukee rigid D wall it's got some good stuff too I personally just use Makita because the guys that I started doing this we're using Makita and I've used I've Makita ever since but there's some [ \_\_ ] that I wish Makita did differently and there's some things that they have not come out with that it pisses me off because other guys have you know like Milwaukee's cats so much [ \_\_ ] I'm jealous of all the stuff that they have but there's some stuff about their tools I don't like either but uh invest in a good tool belt good hand tools and a good drill go get your apprentice card before you start calling around to these companies asking if they're hiring but beyond that that's pretty much it that's what it's like being apprentice you're a helper your bottom rung guy so climb that ladder boys bees [Music] [Music]"

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"VideoID": "149",

"Title": "Electrician’s Handtool Combination Square Ruler 📐#shorts #electrical #construction #tools #Klein",

"URL": "https://www.youtube.com/watch?v=YRA4mxsa2bg",

"Keyword": "Electrical construction techniques",

"Transcript": "check out this Klein Tools combination score I just picked up they got rid of the really annoying thumb screw and they now use magnets to hold in the stainless steel ruler I can slide very quickly adjust the ruler up and down and I can also remove it very quickly pop it right back in super strong magnet check out this rip line foreign"

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{

"VideoID": "150",

"Title": "Construction Top Tips - Electrical Safety Tip 2",

"URL": "https://www.youtube.com/watch?v=3bnZVmx0ff4",

"Keyword": "Electrical construction techniques",

"Transcript": "What is it that I see a big broad range of everything. I mean including guys that are using damaged equipment – I mean they still plug it in, where they’re plugging it into the power source, you go - you can see that it’s damaged, and you’re still plugging it in surely you can say “hey listen this is damaged, don’t use it.” Other ones I’ve seen where the lead has cracked and you can see down to the copper and people are still using it, so you think, ‘seriously’ – just look at what you’re using. You know, the stuff is damaged. You as the worker can have a control over your own safety, and yet you’re not utilising that, you’re putting money and time ahead of your own life. You’ve got to change what you’re thinking. Predominantly they are all simple, simple fixes. For people that come into contact with electricity, generally it’s because something has failed. And one of the things that’s failed is that people don’t look at their equipment. You know they’re not looking to say yes this is in good condition; there are some instances where, like the person that got zapped off the wire in the ceiling space, then that didn’t need to occur if the electrical contractor had of followed through with what they should’ve been doing, which is ensuring that all the cables were terminated. So it wasn’t the person that got the electric shock, you know they wouldn’t have known any different, but the contractor should never have allowed that to occur. But quite often it is the person that’s doing the job is the one that has control over their activity and could have and should have put in place the control to make sure they didn’t get hurt."

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{

"VideoID": "152",

"Title": "another early morning ready for inspection! #electrical #construction",

"URL": "https://www.youtube.com/watch?v=sueWDzfEcKw",

"Keyword": "Electrical construction techniques",

"Transcript": "another beautiful morning here got a new build ready to pass inspection but it's just another day in the life of an electrician"

},

{

"VideoID": "153",

"Title": "Hopefully The Lights Work 😬 #lightingdesign #construction #electrical #shorts",

"URL": "https://www.youtube.com/watch?v=cUYnFTDj4zA",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] thank you"

},

{

"VideoID": "154",

"Title": "Amazing 😱 Electrical construction//electrician #shorts #viral #shortsvideo",

"URL": "https://www.youtube.com/watch?v=nLwMEZR30OM",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] thank you"

},

{

"VideoID": "156",

"Title": "Rough-in electrical: complete!💡✅ Come check out the small but mighty changes. #hurricanerebuild",

"URL": "https://www.youtube.com/watch?v=vAOQsmfqa8Y",

"Keyword": "Electrical construction techniques",

"Transcript": "today is electric day which is extremely exciting because Dan Mullins and his amazing crew is here doing all the Ruffin electrical and made a couple little changes to the house you know if the walls are open why not so adding a sauna upstairs and a washer and dryer upstairs and some lights to the pantries downstairs because they're so dark who does not put a light in the pantry anyhow tiny changes huge difference let's go see what they're doing"

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"VideoID": "157",

"Title": "Barts Electric Prefabs for Lightning-Fast Electrical Installations",

"URL": "https://www.youtube.com/watch?v=CBR83qYBEo8",

"Keyword": "Electrical construction techniques",

"Transcript": "our goal is to do two rooms a day just by the time I leave here this week is to have this narrowed down to a almost zero waste and have the time down to where we can take a new guy or a second year guy and have them install everything in this room in a half a day you know Bart's really been pushing on task in time for a month this is a prime example of where task and time comes into play because Tony and I have we've sat down and we have factored out everything in these rooms and we can tell you what it's supposed to do and what it's supposed to take on paper until we get the guys in here and we get them doing it it's going to give us a real world scenario of what it's going to take to get this thing done and then we can start applying that to our guys in Alabama that are working currently and give them a task in time and it be specific and be measurable and be reportable [Music]"

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{

"VideoID": "158",

"Title": "Run Electrical Wiring at New Construction Home",

"URL": "https://www.youtube.com/watch?v=SohWl7YozR4",

"Keyword": "Electrical construction techniques",

"Transcript": "so you"

},

{

"VideoID": "159",

"Title": "Embarrassing MISTAKES - R Davis Electrical",

"URL": "https://www.youtube.com/watch?v=Z8H\_-HKqRPQ",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign can you give up at any point"

},

{

"VideoID": "162",

"Title": "Construction Electrician Training in Virginia",

"URL": "https://www.youtube.com/watch?v=ibylVHSZMvI",

"Keyword": "Electrical construction techniques",

"Transcript": "hi I'm Brian Stanley I'm with Center ecology Norfolk and I'm the program coordinator for traits I'm building a program from the ground up so I can build electricians from the ground [Music] done everything from running doorbells to running super high voltage on to the middle of the Chesapeake Bay to run dredges and I want to pass that knowledge on I've been everybody in the classroom I've been that apprentice who is staring at the page and it's not making any sense tool I know where they're coming from and because of that I think I can help them to get where they want to go to I'd like to see them go where they want to go their success is my goal here we've got a transformer laboratory we're gonna learn all the processes how to wire transformers to do things that even the transformer didn't know it could do we understand the basics of how they work we could be a lot more creative and then behind us our residential market we're gonna wire it up we're going to connect the wires we're gonna run power to it students are issued a tool set and we start using those tool sets almost immediately we talk about basic circuitry then we do basic circuitry when you get on the job you're gonna see the same things you're gonna see the same problems you're going to come up with better solutions you've been there you've done that it's hard to compete with somebody who's had that kind of training and experience I'm gonna make them as prepared as I can I'm going to give them exposure to what they're gonna see on the jobsite I want to eliminate those surprises wanted to hit the ground with a firm footing and a large base of knowledge people say they want to do this they want to do that and if only they could have a maybe they shut of it we're here we'll make it happen [Music] you"

},

{

"VideoID": "163",

"Title": "The E.S. Boulos Company - Electrical Construction Experts",

"URL": "https://www.youtube.com/watch?v=PPc\_qC1lhtQ",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] headquartered in Westbrook Maine the es bolus company is one of the oldest largest and most experienced electrical contractors in the northeastern United States [Music] founded in 1920 ESB has established a solid reputation for Quality safety and value that makes them a contractor of choice for major construction projects throughout the region when you hire es Bowlers you know you're getting the real thing with Decades of day-to-day management and Industry knowledge bolus's team of smart creative and skilled professionals complete commercial industrial utility and telecommunication projects of every size and scope we don't have to limit ourselves with the type of construction that we go after there's a huge amount of talent within the company what's being in business as long as we have there's nothing we haven't come across or dealt with you can truly see the integration ESB uses the latest Construction Technologies to provide customers with the best value in the market we stand behind every project and every service and every employee that we have myr group is a leading electrical contractor with more than 60 district offices located throughout the United States and Canada 7 900 employees and more than seven thousand pieces of equipment es bolus one of the newest members now has Regional and national talent and support provided by myr group if requested myr has a depth of knowledge that is a significant resource for us working with electricity especially high voltage energy requires a high level of safety training bolus backs up all their employees with a rigorous safety program and we have a reputation throughout New England as being a very safe contractor with all our clients who deal with we have a great safety record a low EMR to prove that and fire extinguisher in this Gang Box there's no question the field can count on getting 100 support from safety with whatever they need any questions the bolus team can solve the most complex logistical challenges and deliver projects on time and on budget the more complex the problem the more appropriate bonuses to solve it the stub beams between the two columns they look at es bulla's company as a can-do type contractor es bolus has a long tradition of Excellence dating back nearly a century we just celebrated our 100th year anniversary and I see us being a better stronger and larger company in the years to come [Music]"

},

{

"VideoID": "165",

"Title": "Running Electrical Wires in Nudura ICF: Contractor&#39;s Guide",

"URL": "https://www.youtube.com/watch?v=sGRZaWsovyI",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] so yeah using the hot wion method I think is traditionally the way they do it I don't have a lot of experience with it so we tried it a little bit and we found that like a sza blade a white sza blade or a chainsaw actually works very well and it's pretty quick"

},

{

"VideoID": "167",

"Title": "Electrical Mast repair at the Roof on a Flip. #integrityairatl #milliondollarinspector #atlantaflip",

"URL": "https://www.youtube.com/watch?v=OnRQotZZgZ0",

"Keyword": "Electrical construction techniques",

"Transcript": "good afternoon guys Melvin Robinson integrity and Home Inspection so I'm out here doing a re-inspection now this is Forest Park Georgia we recommended a couple of things on this roof uh they did do one thing at the uh they put the cricket in at the chimney but here this was a big one the mass hat broke it was actually leaning over you can see that has still had some movement it caulked there put a put a boot over it this uh dead tree caused it broke a limb off I'm sure it hit the power line causes the break so they didn't insulate over the power lines those are hot lines and they use these screws and put them into uh the roof straight into the roof with cables tie backs that's pretty loose so that's not even holding it back I don't even know what that's doing but anyway but this one is the most tension that's on it and they did not caulk around that So eventually water is going to make its way through there and that needs to be uh secured weird repair I've never seen it like that I'll put a note in there but uh this is what we deal with Atlanta Georgia Melvin Robinson and take it air Home Inspection have a great day"

},

{

"VideoID": "169",

"Title": "Electrical Construction Industry Training - How to Measure Productivity/Training",

"URL": "https://www.youtube.com/watch?v=4dIPLG6dwl8",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] welcome back to your home for electrical industry news information and entertainment electric tv.net powered by the NAA ibw team I'm your host Dominic Jano how do you measure the training of a crafts professional in today's construction industry I want you to think about that really and truly how do you measure training can you evaluate training based on looks alone the na IBEW team believes the answer isn't as easy as it seems they believe it takes 5 years in over 8,000 hours of on the- job training and an additional 900 hours of related instruction and it just so happens that's exactly how long it takes to complete a union electrical apprenticeship program an increasing number of suppliers and manufacturers some of the big biggest names in the business are also beginning to see that this Union self-funded training model is not only the way but the only way Education and Training is big business it's not something that should be taken lightly and certainly deserves more than the lip service many give it in today's construction industry hands down unequivocally and without question NAA the national electrical contractors Association and the ibw the International Brotherhood of Electrical Workers have the most Advanced and 21st century training operation in the history of the industry their training arm the njatc makes sure of it we develop the standards and and create the curriculum that is taught Across the Nation uh for all of our apprentices and Journeymen that are in the electrical industry throughout the 285 Local Union training centers no longer are the current 40,000 Union apprentices being trained in the same old ways additional Hands-On techniques are now being blended with high-tech computer-based learning applications allowing for this new breed of apprentice to become proficient in the basics and masters with in demand GEOS specific job skills now giving the flexibility of each region to say we want to move more in an industrial route we want to move more in a green energy we want to move more in these various specializations and the training now can adapt to the needs of the contractors in those re to provide more flexibility to allow them to bid on more jobs that are related to what they need to do there's a desperate need for change in the electrical industry in particular and we think we can be a catalyst for that and working with the njc is a really solid opportunity to do that this new approach is called Blended learning and it's made possible through new Partnerships with some of the best suppliers and manufacturers in the construction industry some of which we caught up with at a recent training partner Summits in South Carolina to really get together with an organization a top organization like the njatc understand what their moving forward goals are how they're really um developing and evolving the way that that students learn today in incorporating that Blended learning approach and it provides an opportunity for us to get not only line of sight on what they think is important and where they're headed but also to talk with other industry leaders about how we can work together to provide an even better experience for the participants who go through the JATC training programs for the njtc staff themselves uh you know it's an excellent Forum to get realtime feedback about what matters right how do we continue we the njc how do we continue to to um provide that right organization the right framework uh to accomplish what each individual training partner needs yet at the same time move the whole industry forward from our standpoint it's a comfortable environment uh we get to be very expressive with our opinions uh the team here listens very well and we're excited to participate because we actually get value and not only at a high level but we get to go back and we take some of those strategic thoughts and actually go back to the field and employ them I think the other thing about these meetings I've noticed over the years is they are getting better they're getting more comprehensive with more people involved um you learn from one another people have new ideas and uh the communication is great the latest Technologies products and services are now getting into the hands of today's apprentices before they hit your job site you're going from more of a book environment with somebody who was maybe trained that way long ago into more of a 3D interactive environment the njatc is a a top tier organization that really provides a well seasoned well-rounded well educated electrical worker in the industry it's a a premier organization that really thinks about not only how to install a device but educating the workforce on why and where and what makes the best most safe um practical installation for everybody involved both for the worker and for the end user at at the end of the installation it really happens with the electricians in the field and from our standpoint you know when you have an electrician that you would hire from this organization you know that they've been trained very well very thoroughly and very professionally we think this is a this is a chance to actually uh influence how things are done not just what products use but but in fact how things are done in the future in the electrical industry the question then becomes who benefits the most the benefit to the enduser of the njatc program and our partnering with the njatc to deliver the best education to installers is that that they get a safer building they get a quality installation with with fewer problems better reliab ab ility and the best possible efficiency that that they would want ultimately the customer is why we're in business we serve the customer but in this process of these Partnerships you know everybody benefits and uh I think that's the best part of it and it's just educating people how that can happen anytime that you're working with someone who's providing the equipment and the tools that you work with every day uh and it gives us an opportunity to enhance our membership's ability to to do the job job it it's got to be a win-win the NAA ibw team measures training by the millions of self-funded training dollars they invest annually the tens of thousands of new Apprentice graduates ready to go to work on your next project and the innumerable happy customers who've seen the value of a union built job since 1891 we began this video with a question and we'd like to end with one too can you name another company in the electrical industry who can measure training better than the NAA ibw team we can't either and as always remember that as the industry changes the na ibw team will change with it and continue to not just train but train well want to be kept in the loop when we post content here on electric TV it's easy subscribe above follow us on Twitter for even more news and information until next time I'm Dominic Jano so long for now"

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"VideoID": "171",

"Title": "ELECTRICAL ESTIMATING | Applying Overhead as a Dollar Amount 💲vs %",

"URL": "https://www.youtube.com/watch?v=M5Wh31DB2Ys",

"Keyword": "Electrical construction techniques",

"Transcript": "consider applying overhead as a dollar amount per hour rather than the percentage applied to the entire job this would be especially helpful in situations where a large portion of the job is owner furnished and you're not getting the normal overhead percentage applied to that portion of the job yet you're still doing the same amount of work to figure out that dollar amount you just take your total overhead and divide that by the number of hours per month for the field employees so if we have 10 employees and they're working 160 hours a month that would be 1600 hours we divide that unless our overhead is 32 000 that would be twenty dollars an hour in ebm we just go to the job totals and enter it as per labor hour I would do it on direct and non-productive labor please subscribe to see more of our videos"

},

{

"VideoID": "172",

"Title": "Electrician for the day!! #shorts #construction",

"URL": "https://www.youtube.com/watch?v=X9uesXoZXHE",

"Keyword": "Electrical construction techniques",

"Transcript": "is a saying a jack of all trades is a master of none and it is it breaks my heart when people when they use it and they don't understand that the original saying is actually longer than that are you are you familiar no a jack of all trades is a master of none but still always better than a master of one is actually the complete quote [Music] yes sir oh it's pretty good though"

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{

"VideoID": "173",

"Title": "electrical how to install underground wiring",

"URL": "https://www.youtube.com/watch?v=SPY7NXfYW74",

"Keyword": "Electrical construction techniques",

"Transcript": "check this out we got a bonded bellbox right there and UF cable in PBC goes underground 12 inches gsci protection good to go"

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{

"VideoID": "174",

"Title": "How are you pre installing electrical",

"URL": "https://www.youtube.com/watch?v=15xD-AOLc1c",

"Keyword": "Electrical construction techniques",

"Transcript": "fuzzy sparkies how are you pre-installing your gear are you putting a mounting bracket in before or are you using c-clips all I'm doing is pretty much marking on the ground exactly what height I put the cables in and come in later just put in a c-clip so with all these you can see we've got switch 1150 I also take a photo of it I take a photo of the wall have these ready cut this and it's literally right there just make sure that I'm obviously not cutting into the cable when I cut through but yeah that's what I'm doing throw a c-clip on you're done"

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{

"VideoID": "175",

"Title": "Installing vinyl &amp; water resistant heat shrink connectors.⚡️#diy #electrical #construction #howto",

"URL": "https://www.youtube.com/watch?v=uyGKDHoSz8o",

"Keyword": "Electrical construction techniques",

"Transcript": "Final on each ring terminals are the two most common ways to connect wires I'm going to show you how to install both here I have some 12 gauge wire and want to strip off about a quarter inch of the sheathing it's important to double check to make sure the copper wasn't damaged starting with an insulated vinyl ring connector we're going to insert our stripped wire into the underside once it's in the correct place we're going to want to crimp it with our tool inspect the crimp and give it a little tug to make sure it's secure next we're going to do the same thing but with a water resistant heat shrink connector start by stripping the wire push the connector on and give it a crimp double check your connection and then fire up your heating tool once the sheathing shrinks down to the wire size it's done be sure not to overheat the more you know the more you can share boltsandnuts.com"

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"VideoID": "176",

"Title": "How to do Electrical wiring | concrete roof electrical work | house plan simple method",

"URL": "https://www.youtube.com/watch?v=qex9AQt0sSE",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] foreign m is foreign [Music] [Music] foreign foreign [Music] foreign my foreign [Music] foreign [Music] thank you [Music] you"

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"VideoID": "177",

"Title": "￼￼Electrical 240 v plug in garage for RV or Tesla charger #electrical #construction #sparky #shorts",

"URL": "https://www.youtube.com/watch?v=8RWhRyeDpjI",

"Keyword": "Electrical construction techniques",

"Transcript": "there we go we got the wire up up we're gonna sleeve this right here with a three-quarter it's going to stab into this uh small little gutter then I'm gonna have another three quarter coming here with the mini there went ahead and Lace"

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{

"VideoID": "178",

"Title": "How To Run Electrical Wires Through Studs",

"URL": "https://www.youtube.com/watch?v=HTrsF20jA80",

"Keyword": "Electrical construction techniques",

"Transcript": "so what do you need to consider to make sure you're safe and code compliant when drilling holes through your studs for your electrical projects around the house so we use this project as a demonstration it's a bathroom rehab project where I needed to do some drywall repairs so I used some scrap flooring in my oscillating tool to cut a nice straight line across to get that damaged drywall out well this also opened up a great path for me to run new Romex changing the light location for the vanity light from the ceiling to the wall to do this effectively of course I needed to drill through some studs so let's talk about what I consider to make sure I'm code compliant and staying away from any issues with inspection so the first of the two main things you consider when actually positioning your bit to drill through a 2x4 is how close can you be to the edge of the 2x4 two main codes that we'll take into consideration the first is building code and this is associated more to the structure of your home make sure you're not compromising the structural Integrity of a load bearing or non-load bearing wall for for this one it calls out your hole should not be closer than 5 8 of an inch to the outside edge of that stud this is usually pretty easy to meet because there's a stricter standard and that one is called out by any c and that is an inch and a quarter so your hole cannot be closer than an inch and a quarter to the outside surface and let me show you why so the stricter NEC coat of an inch and a quarter is really driven by wanting to protect this Romex with modern building construction and a half inch drywall inch and a quarter are your most common drywall screws but an inch and five eighths you'll see used commonly as well so what that means is if that half inch drywall was secured with an inch and a quarter you'd have three quarters of an inch of the screw penetrating into the stud so obviously this clearance is going to be plenty but even for that inch and 5 8 you're gonna have one and one eighth of an inch of the screw penetrating into the stud and that is going to protect it and be within the envelope called out by the NAC to make sure the screw is now puncturing or contacting your non-metallic romance so the second thing we need to consider is how much material can we remove or how big of a hole can we drill through the stud now remember I'm giving you my experience I'm not a licensed electrician and you need to check in your own area for instance in Chicago you can't even usually run Romex you need to use conduit check with your local inspector to make sure you don't hit any snags on your project as you get going now when it comes to drilling through the studs I prefer these Irwin speedboard bits it's a fast smooth hole and it doesn't have any blowout on the back side I like these small four inch and you'll see in my Amazon store I have an assortment six pack that I bought and that's what I've been using on these projects and then if I need more length I just get these quick disconnects this one's specifically from Diablo which will give me that length and then I can vary the length of all the different bore sizes of my four inch speed bore so it just works well for me and that's the setup and that's what I wrap recommend on my Amazon store but your other options are a standard spade bit which I did drill some larger holes we'll talk about here in a second why I went larger or just a classic auger bit I use this one more on Deck projects to drill out holes for like carriage bolts but the code requirement you need to go to for the size of hole is I go the conservative route of never removing more than 40 percent of the stud now in terms of building code sometimes you can go up to 60 especially if that's not a non-load bearing wall or if you have doubled up studs sometimes you can go a little bigger that's a little bit more common in plumbing maybe when you're running a vent line through a wall cavity to get it where you need in the Attic So the 40 that is going to associate to one and three quarters of an inch on a standard three and a half inch wide stud so you could go up to an inch and three eighths but remember if you're drilling out an inch and 3 8 in the middle of the stud you're going to start are conflicting with that inch and a quarter clearance especially if you have drywall on both sides of that wall so you need to consider the edge requirement that we talked about and also the whole size requirement now the most common hole that I go with is three quarters of an inch drill three quarters of an inch and that gives me plenty of room for one or two pieces of Romex and the last thing I want to touch on is what other options do you have to increase the safety to make sure that your Romex is never getting damaged so for the holes drilled through these two studs making up the corner here that was actually one and eighth of an inch you can see that hole is actually within the envelope that we should be keeping clear of an inch and a quarter to the edge surface so an expector could fail me for that issue to correct that issue you can get these nail Placer 1 16 of an inch wide and those would go right on the outside surface of the stud and then you just Hammer those in place and now you have protection for any screws or nails that would want to come through they're going to hit the plate the nail plate before puncturing through the stud and possibly damaging your Romex so these plates can be another factor of safety because remember we talked about drywall screws but depending on where your Romex is going somebody might be sinking a much larger Fastener into that stud if they're hanging a shelf or hanging something that needs to hold a load and these are just a safer way to go about it putting a plate on each stud where you have holes and we have Romex running through and let me show you the last option which I ran across recently which I think is pretty cool so local Menards which is a large Home Improvement store here in the Midwest have these easy guards so that actually lines the hole here the hole that you drilled out and that's why I drilled out the inch in 1 8. that is the side needed for these easy guards but it lines it with your nail or plate opposed to putting that nail or plate on the outside surface so all you do is place that within the one in 1 8 inch of hole give it a little tap foreign bushing and also an integrated nailer plate so if any Fasteners came from the outside they would hit that metal housing opposed to your Romex these make for a super clean and well protected install and you'll see a link in the description to these just in case you don't have a Menards in your area so let me know what comments you have and specifically in your area are there different codes or regulations that run contrary to what we overviewed here and then just another point is the price so 58 cents for these plates and about 81 cents if I bought a pack of 25 from Menards for these easy guards now some of the instances you need two plates one on each side so the easy guard could actually be cheaper now if you want to avoid the five DIY electrical mistakes I've made over the past few years check out this video right here and I'll quickly run through the mistakes I made that the commenters and viewers pointed out so thanks for joining me on this video and we'll catch you on the next one take care"

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"VideoID": "179",

"Title": "Electrical Installation Top Tips",

"URL": "https://www.youtube.com/watch?v=MkpI3rcN1qk",

"Keyword": "Electrical construction techniques",

"Transcript": "where when we're using the hole saw to remove some of the plasterboard taking the paper sheet from one side fixing that back which leaves you a mil or so so when you're refilling it doesn't protrude afterwards and also making use of the stud body to find out whereabouts the joists are within the building and one thing that the whole efix team could take on board is tidying up as you go along [Music]"

},

{

"VideoID": "182",

"Title": "chase cutting for conduit pipe/electrical work#electrical #construction #shorts",

"URL": "https://www.youtube.com/watch?v=i5h7LTCI0n0",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign [Music]"

},

{

"VideoID": "185",

"Title": "Electrical Construction &amp; Maintenance - Thaddeus Stevens College of Technology",

"URL": "https://www.youtube.com/watch?v=HngYQGaptos",

"Keyword": "Electrical construction techniques",

"Transcript": "well I'm like oxen ford on the construction electrical instructor at Thaddeus Stevens College and I'm here to talk to you a little bit today about what's expected of our students at an arts program you do not need electrical experience to be successful in the construction electrical program and we would take you from little to no knowledge to being able to wire our house project that we do here at our school as well as commercial and industrial wiring techniques we teach at the school also our students are expected to be on time he prepares to learn each day and try something new they're going to be having homework every night to do we do review the homework beforehand in class so they know a little bit what's going on and we can help them and as far as the classroom goes we do theory everyday for part of the day so the students would be expected to homework like I said earlier and also they would be given a quiz every Friday use typically on a Friday a quiz and then every three weeks we would be doing taking a exam when that chapter that we're working on or it could be two chapters at a time so in addition to that then we would come in to the chop area here and work on projects we have both residential projects and commercial projects that the students are expected to complete each and every day they're working on there's a set amount of projects for each semester and they are great on those projects as well and that is figured in with the theory grade to come about their grade for the classroom we take them from basic wiring projects learning about Ohm's law to wiring switches receptacles light fixtures found in whole commercial places such as the school here we do projects around the school for the school maintenance projects it's just like real life work we build an actual house at the that the school sells when it's finished in the spring and it's we do every all the electrical wiring from beginning to end in that house as you can see the studs in this room is what the house would look like in construction electrical it's exactly what it sounds like it could be you could be working out in a ditch someplace you could be working in a confined space and we learn about safety is our number one priority we will learn about all the tools we use we use power tools hand tools wood drill holes at the house project and mount our boxes pull wires through there we run conduit what's known as conduit it's physically demanding as you can see I'm standing next to a ladder we work lawful ladders off a scaffold we could work at height at the house project we will be on different floors in the house working we could be outside on the scaffold putting the service down the side of the house we're out in all kinds of weather whether it be hot cold everything in between we do have to dress for the weather on this particular type of work thanks again for your time I appreciate your interest in the construction electrical program and I hope you choose Thaddeus Stevens College hi my name is Adam clear off hi guys my name is Lisa Ralph we're first-year students here at Thaddeus Stevens College of Technology we are majoring in construction electrical and we're here to tell you guys as students how to succeed at the construction electrician program here at values the workload here at Thaddeus Stevens in the construction electrical course isn't actually as bad as you would think it's really important that you read up on all your books in order to understand exactly what's going on and shop and in theory class I'm here to talk about the instructor he's been doing this for about thirty years now so he has a wealth of knowledge for the students so if you have any questions you can ask him he'll most likely know the answer if he doesn't he'll go and try to find the answer for you he runs it like a job where he expects you to be on time you know have attendance here because it's a short program it's only a year so if you miss a couple days you're gonna fall behind pretty fast and the way he runs it from the beginning it's kind of like a crawl walk run when you first get here you know he's gonna help you out with a lot of the wiring diagrams and stuff like that and then as you progress farther along in the course you know he's more hands-off he'll let you make your own mistakes and he'll come back and correct them and I mean first I'll try to see if you know the answer to it and then if you can't figure out he'll come and help you most people come into this program thinking that they're going to be in shock the whole nine months that they're here but actually we're in a classroom or we're practicing and going over a theory methods and then as you can look around this is actually our shop that we work in so we're in here majority of the time as well we also towards the end of the year had the chance to work on a house so we actually wire up the house from top to bottom for characteristics you want to be for a good electrician you know someone that's good at problem-solving because you're gonna have to figure out you know your own wiring diagrams your own wiring schematics you know from a floor plan you also want to be someone that's can pay attention to detail and it's good with accuracy the reason that is you know you're working with electricity so it's hazardous if you wire it up wrong third thing safety someone that's always conscious of safety because like I said electricity is dangerous and then finally someone that can work individually or in a big group because outside of fear you might go to a small residential where you know you're only working with four guys or something like that or you can go to a big commercial site where there's 50 electricians yeah they're working with so you want to have that communication skill it's work in a big group in conclusion you know you don't really need to have a background electricity to succeed in this course I did it you know I mean I twisted a few wires here and there but I didn't know anything about you know the you rework or anything like that in this course but like I said mr. L has a wealth of knowledge so he's helped me you know learn a little bit about electricity in the long run I agree with Adam 100% I also feel that if you're a female and you're interested in this trade I came in horrified so scared not knowing exactly what was going on I didn't even know some of the names of some of my tools but mr. oh and all my other classmates work with me they helped me on project have any questions or concerns they're always there so thanks for taking your time out listening to us talk about how to succeed in this program and we hope to see you guys here soon enough"

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"VideoID": "186",

"Title": "15 Construction Business Ideas to Start your Own Business in 2024",

"URL": "https://www.youtube.com/watch?v=AGQDK6FY1ks",

"Keyword": "Electrical construction techniques",

"Transcript": "are you thinking about starting your own construction business but not sure where to begin the construction industry offers a wide range of opportunities for entrepreneurs who are willing to put in time and effort to succeed in this video we'll explore 15 construction business ideas to start your own business in the construction industry number one General Contracting as a general contractor you'll be responsible for overseeing construction projects from start to finish you'll need a broad knowledge of construction processes and regulations and the ability to manage subcontractors and suppliers number two home renovation with more and more people renovating their homes rather than moving there's a growing demand for skilled Renovators who can transform outdated homes into modern spaces number three custom home building if you have experience in construction industry and a passion for creating unique homes custom home building could be the perfect business for you number four green building with a focus on sustainable materials and energy efficient construction methods Green Building is becoming more popular with environmentally conscious clients number five concrete work has a concrete contractor you'll be responsible for pouring shaping and finishing concrete surfaces number six Masonry masonry work involves building structures from bricks stones and other materials with a focus on precision and attention to detail masonry can be rewarding and challenging construction business number seven Roofing with a constant need for repairs and Replacements the roofing industry offers a steady stream of work as a roofing contractor you'll need to have knowledge of different roofing materials and installation methods number eight painting as a painting contractor you'll be responsible for selecting and applying paint to different surfaces number nine electrical work as an electrical contractor you'll be responsible for installing and maintaining electrical systems and buildings you'll need to have a thorough understanding of electrical codes and safety regulations number 10 Plumbing from installing new pipes to repairing leaks Plumbing is a critical component of any construction project as a plumbing contractor you'll need to have a strong knowledge of Plumbing Systems and building codes number 11 HVAC heating ventilation and air conditioning systems are essential for comfortable living and working spaces as an HVAC contractor you'll need to have knowledge of different heating and cooling systems and be able to install and maintain them number 12 Landscaping from designing outdoor spaces to planting and maintaining Gardens Landscaping can be a rewarding and creative construction business number 13 swimming pool construction with a focus on design and installation of swimming pools this specialized construction business requires knowledge of pool systems and safety regulations number 14 demolition from tearing down old buildings to clearing land for new construction demolition is a vital part of many construction projects and number 15 excavation excavation involves digging and moving dirt rocks and other materials to prepare a construction site for building as an excavation contractor you'll need to have knowledge of different excavation techniques and equipment"

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"VideoID": "187",

"Title": "How to Pull Electrical Wire Through a Pipe or Conduit 3x faster - How to wire a She Shed",

"URL": "https://www.youtube.com/watch?v=Frt0vJ4k15g",

"Keyword": "Electrical construction techniques",

"Transcript": "Tim here with the Jacksonville trades and we are going to teach you guys how to wire a shed but the first part of wiring a shed is getting wire in the pipe all the way down to the shed in this case we're going to wire a shed that's 161 feet away so I'm going to use just these items as the easiest way after all the years people use fish tapes and they're okay but they're a lot of work and they're paying and they're kind of dangerous they're trying to poke you in the eye and stuff we are going to use a water bottle a little bit of string a sandwich baggie and a shop vac to push 161 feet of wire I'm going to show you how to do it right now first thing you do is empty the water bottle next thing you do pull out your trusty knife I like this guy it's my favorite and we're either going to cut the bottom off this bottle second thing you do is right here in the tip you're gonna take it you're gonna make an incision in the flat part of the bottle are you gonna make another incision so that it has two little flaps just like that once you have your two little flaps once you have your cute little facts you're going to take and bend them in spring and we're going to we're going to swing it through the hole through the mouth of this right here like this now this is the fun part we're going to use this sandwich Maggie right here and we're going to take just the corner of it so all we have is the corner of the sandwich baggie now if you come back here that we're doing a one inch pipe right here so you want to make sure that this piece of Sandwich baggy you want to blow it up a little bit but you want to make sure it's enough to fit down that hole there once you have that you close the one end you take it you tie a little knot of string on here we'll make sure it's nice and tight you don't want to blow it off otherwise you'll have to do it again now there's a lot of people that when they do this they use like what's called a little mouse it's a little tiny sock and they tie the string onto the little eyelet and then they put it in the hole and then they go to the other end of the hole and they suck it through with a shop vac that works okay I did it that way for years but about 10 years ago I was working with another company and they showed me that you can blow it which is way easier with the sandwich bag because those little mice that they call them as they blow through there they can actually get suck up any water or moisture that's in that pipe from rain or however long that you can do it and by doing that um those socks can get stuck they're really easy to get stuck and you have to have a high powered vacuum to get enough suction to suck sometimes those out of there with what we're going to do we're going to blow this by blowing this uh it'll go very quickly it'll move about Mach 5 and the reason why it works better is because this little piece of plastic here works as a sail it'll fill the entire pipe and the air has to escape the pipe when you're blowing it in and this bottle the idea is it will fit firmly around the end of this pipe creating a perfect blow nozzle to go in the hole but the first thing you have to do is make sure your soft back is not set on suck let's set on Blow so let's get it set up here we had to switch to a more rigid bottle so we decided to switch to like a plastic sparkling water drink I do the same thing I cut a hole I fed my baggie through and I've got a spot so the air hose can fit here and then it'll blow down now normally when you do this you don't want to have the box on already because you can set the bottle directly on top and blown in but because they did this I'm gonna have to add a little extra to it you want the air to blow straight through so in this case I have to pinch it to get it there so I am going to add a layer of electrical tape to hold it so that I can get the angle I need in this case in order to make sure that it stays on there so when you're using electrical tape most people don't realize it's PVC tape you want to pull it and stretch it tight when you use it to get a Tight Seal with your fishing wire if you don't do this then you will find yourself struggling and wires coming unpold and stuff when you're pulling wire so take this PVC tape and stretch it and always make sure you have a good good layer of it like so see there's no way this is going to pull off and now I can get the angle like this spark on the hole as we can okay make sure this is facing towards us you want to make sure that the string can move freely through here down in here without being pinched or cut without grabbing a corner if you can help it get this ain't into the hole I have two power system with a high Circle and if it gets hot all you gotta do is pull back on it a little bit and it'll start to suck in I'm not sure why this will cut so quickly and when it's soft it's usually because it hit the other side already and there you have it once you have it all pulled through that way you go like this and then you can take if you're not going to pull it real quickly you cut it and you're going to want to tape it to the pipe here so that it doesn't actually fall back in if you were having troubles blowing it in a lot of the time it's because your bag isn't big enough to fill the entire pipe so is it creating an entirely airtight seal to push the wire all the way through strong enough so just make your corner of your sandwich baggie a little larger and then there you go next we're going to show you how to tie the wires onto here properly so they don't come off and pull them over to our sheds so we can get our shed wire all right when you're putting a pulling wire the first thing you do is get it in a spot where it can spin in this case I have these specialty Spinners sitting on some concrete stakes two and two you can use any piece of bar through the that'll fit in the spindles that you're using a lot of the times I'll use like a four foot or a six foot A-frame ladder and run it in between the rungs so I can get the spin I just want to make sure to keep it low if you're using a ladder seam on top of the ladder over the most important part of this is the setup you want to make sure that all your wire is facing the same direction you want to make sure that each of your spindles are coming from a back up and over and not just one bar but they all need to pull the same that way they don't get tangled up or knotted up and when you're in the middle of your pole you don't have to stop so that is how you get these going now I'm going to show you how to tape these onto the string to make sure that you don't lose them while you're pulling all right so now we're going to take the string that we have tried off and we're going to carefully untie it when you're doing this you're doing all the work I'm about to show you you got to make sure not to pull on it too tight you don't want to pull the other end of the string off so now the first thing we need to do is we need to line these up as you're lining up the wires note you don't want to have them all flush tight to the end like this if you have them all flushed right to the end and once you tape them on it's going to make a big Edge that can catch the couplings and the Tas you don't want that you want your wire to pull smoothly through the conduit so you're going to want to pull them a little bit staggered you know so that when you tighten them all up and you have them all tightened and taped on your your tape will make an angle like a ramp and that'll keep you from going on there the other thing is when you go to tie your string on you want to make sure you have plenty of connection so you want to make sure you get at least a foot of tape on this thing with the string holding in every which way that way you don't accidentally have a wire come loose there's nothing worse than a wire coming loose and you have to pull the wires out that are all tangled and then you have to try to re-pull them through the pipe okay step one first you gotta tie a knot like I said I come a little over a foot down so I'm going to come down here and I'm going to leave a big gap and I'm going to tie a knot now when you tie this knot you want to twist it in such a way that it is the opposite when you pull it tight so I came from underneath that way when I pull a grip and then I come back it grabs a hold of these wires okay and then I personally like to tie several knots that's why I left such a big lead so I'm going to come down here and I'm going to tie a couple more of these knots the one that pulls the other way opposite away from what I pulled the first time see now these got a good nice tight grip on here so that these two knots are pulling opposite directions so that now when I start the taping process I know that my it'll have something tight to pull against net next we're going to grab our electrical tape this is our stretchy PVC tape like I was telling you earlier on the video and we're going to start all the way at the end of this wire and we're gonna pull it so that this wire you want to make sure the string kind of Twirls around and grabs a really good hole and then you're going to give it a little wrap and then you're going to suck it tight a wrap pull it tight a wrap pull it tight wrap I'm stretching it as I pull if you don't stretch the tape then it'll stretch while you're pulling and if it stretches while you're pulling then your your wires will come out of the pole and I'm pulling 161 feet the last thing I want is these wires to come out while I'm pulling and then have to pull 80 or 90 feet of this wire out and then have it uh tangle up because when you pull it out it wants to recoil like it's still on the spindle so now as you look right here you can see that we have all of these wires staggered and it gets smaller and smaller as we come down each wire so there's less of an area for it to hit if you have an area like this that's pretty abrupt we're going to go ahead and put a little bit more tape on that to make that angle a little less steep [Music] [Music] so now when it's pulling through the couplings it'll have more of a roll there see it's not so sharp so that when it's pulling through and it has to hit this part or when it's turning through the 90s and it's bent it ain't grabbing the edge of the couplings or the Bell ends of the pipe next next we're going to go ahead and push this in a little bit now most people don't realize this you can push it in pretty far when you're pulling this it takes two people and because I'm so far away it's definitely going to take a few people you want one person here pulling and making sure nothing gets Tangled because nothing worse than getting caught on one end not seeing and yanking the string out and pushing it down because the further away the more to help and then on the other end we'll take you over there and show you that as well uh we will be pulling the string out and then the one guy on one end will be pulling it out and the other guy will be pushing in and I'm going to show you a trick to making it a little easier on your hands for pulling the string through let's head over to the other side and check it out okay now we're at the other end by the shed that we want to wire this is the other end of our pipe and we I did not strap this down yet because I want to be able to have a little bit of angle on it when I'm pulling the wire through uh because as you pull if you're coming up straight you could strip or cut the wire on the edge of this now what you want to do is grab and pull but this thin little string pulling and pulling will start to tear your hand up if the wire gets kind of hard and taut to pull the key is to use a hammer so you take your hammer you make one wrap around you hold it with your hand and then you can pull up on the string and then slide it down and then pull up on the string and then slide it down and pull up on the string and you will do this until the wire comes through from the other side now remember you'll need somebody pushing the wire from the other side and making sure it doesn't get tangled all right let's get this thing pulled and then we'll show you what's up okay now that we got all the wires done first of all you always want to make sure you have enough wire I don't know if you can see this but yeah buddy we had enough Wire by about 10 inches on this one uh you want to make sure you always have enough wires like I said you don't want to have to pull it out but now that we have enough wire we got enough hanging out of the box here we're gonna go ahead and cut them all even and then I like to tie a knot in them and the reason why I like to try them out of them is in case something happens on the other end the wires don't get pulled back in the pull or back in the hole because they get pulled back in the hole you have to redo this whole process again I think it you know it takes 20 minutes a half hour sometimes or maybe longer so you want to make sure you get all of these in here knot it off big enough they don't pull very easily and unless you're now if you're going to be hooking them up then wire nuts will keep you from going back in there but in this case I'm not ready I still got to pull wire to the house and I can't I don't have that wire with me I won't be able to pull it till Monday so that is how you pull wire through conduit through a shed like I said we've just pulled 161 feet of wire I know it's a little noisy in the background but if you stay tuned to the next videos I'm going to show you how to actually wire the Shag and how to wire this all into the panel and how it all worked uh thank you and if you like this video don't forget to hit like And subscribe and keep an eye out for all the crazy stuff the Jacksonville trades are doing thank you"

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"VideoID": "188",

"Title": "RESIDENTIAL ELECTRICAL MATERIALS Apprentice Electricians Should Know",

"URL": "https://www.youtube.com/watch?v=ZNQsFbEwxMo",

"Keyword": "Electrical construction techniques",

"Transcript": "What's going on my friends this is Dustin Stelzer   with Electrician U and today we're going \nto talk about a whole bunch of different materials that you should know if you're \ngetting into the residential electrical game Alright number 1 on our list is romex. A lot of \npeople call this Romex, Romex is really a brand It's actually called nonmetallic sheathed \ncable. This specifically is NM type-B There's several different types \nof nonmetallic sheathed cable,   but this is the stuff that you run in the wall So between plugs and switches and pretty much \neverything in a house, you're gonna use romex Number 2 staples Staples are what we use to secure \nthat type NM-B cable to walls There's several different types of \nstaples. There's several different   depths some of them have ratings \nso that you can put one of these pieces of romex under one staple Some of them are rated for two. There's a whole   debate on whether or not you \nshould be stacking multiple conductors or multiple pieces of romex under   a staple. We'll get into that \nconversation at a later date But just know staples are your \nmethod of securing said cable. Number 3 is the nail on box. Nail on boxes are what they say they are. It's a \nbox with nails that come on it You hammer these into a wood \nstud and that's what holds the box in place and then you run wire into it \nand you're gonna have a receptacle or a switch or something in this box. They come in a bunch   of sizes because you may have \none device. This is a one-gang This is a two-gang nail-on box. So you \ncould have two switches, two plugs, whatever three-gang nail-on box and a four-gang \nnail-on box. There's many different   types and styles some come \nwith screws some come with brackets some come with a little a little extra piece of plastic with holes \nin it so you can screw it in but   essentially they're all doing the same purpose They're all being nailed on to a stud Next is the pop pin box or the cut-in box,   depending on where you're at in \nthe country what people call it This is a single gang Same thing as the nail on it's just \nthat these get cut into sheetrock So you would typically use these in \na job like a remodel or something or   if you're adding something to \nan existing house that already has all the sheetrock up and \nyou need to put something Receptacle or a switch somewhere So this is the stuff that you would \nuse when there's already sheetrock up The other stuff is what you would use if \nit's just wood and it's a brand new building So these come in single-gang, \nI don't have a two-gang...you   don't know how much that actually irritates me But I do have a three-gang and I do have a \nfour-gang. So again the same kind of thing You're just putting several different \ndevices in these and have different sizes   depending on how many different \ndevices you're putting in them Next is the round nail on \nbox. So these are for lights Usually you're gonna have these in a \nceiling somewhere run wire into it.   And then your light fixture \nis going to attach to this They're always round. There's several different   styles of these again. This is \na four inch round nail on box Next up is the round pop in box or cut in box this is if there's already sheetrock up and you're \nadding a light somewhere cut the sheetrock out and Stick this up in the hole and secure it down and \nit's going to hold itself against the sheetrock This is a three inch round This is a four inch round again \nmultiple different styles of each,   but you need to know the round pop in box Number seven is the pancake. So this is a box that \nyou would use. It's only the depth of sheetrock So if you have something like a piece of   wood a stud or something and you \nhave to have a light right there It can't be moved over into the open space,   you would use a pancake and you \nrun your conductors into this Very few conductors. These aren't rated \nto have a whole bunch of wires in them So you have to know a little bit about box fill,   but essentially you just need \nto know this is called a pancake Number eight is the fan-cake, so Fan cake is basically the same thing as a \npancake. It's just that it's fan-rated. So You can't hang a fan from this pancake. \nYou have to have a fancake instead Or a fan rated pancake. (We just \ncall them fan cakes.) Reason is,   is a pancake has these tiny little ears on them and with enough \nweight you can bend those ears So for a fan, they typically weigh a \nwhole lot more than a light fixture You need something that has a hard side that's \nthreaded and reinforced that can hold a fan. So You need to know fan-cake Next up is the fan brace. So just like a fan cake \nis meant to hold a fan, a fan braces is as well the only difference between the \nfan cake and the fan brace is if You're mounting to wood, then you \nwould use something like this the   fan cake if you're mounting in between a chase You know in between two trusses then you're going \nto use something like this a super heavy-duty Usually holds between 50 and 70 pounds depending \non which rating you're using (CSA or UL's rating) But just know, fan braces are for fans. We also \nuse these a lot for really heavy chandeliers Or really heavy lighting that we put up \nif we think that a regular box, you know something like this or or A nail on box is not stout enough and we   think it's gonna rip hunter the \nceiling if we use one of these Then we'll use something a lot more heavy-duty   like this fan brace for it. \nNext up is the bar hanger So a bar hanger is really essentially one \nof these nail on boxes just on a hanger So if you're not nailing \nit up to a stud or a truss You're gonna put it in between two of them \njust like you would do with the fan brace and then this whole thing slides you're \ngonna use these things like crazy Sometimes you'll use them \nin walls. So they'll face   out like this and a light fixture will hang off Sometimes you put them up in the \nceiling but you're gonna do light weight stuff with one of these you're not putting,   you know a 300-pound fixture \nhanging from it. It's plastic So it's got plastic holes. It's \nyou put threaded screws into it And if it's heavy enough Something can rip out of this so you would still need to use \nlike a fan brace or a fan cake   or something heavy-duty if you're gonna do like a Fan or like a 100 pound chandelier. Next up is   the duplex receptacle. It's called a \nduplex receptacle because there's two receptacles you can plug two different things into \nthis. So you're gonna install so many of these that you're not ever even gonna be able \nto count the amount of duplex receptacles you're going to put in but just know this \nis a duplex receptacle. This is not a plug This is a receptacle. Although you're gonna \nhear so many people just call this a plug Next is the single receptacle. So just \nlike a duplex receptacle it receives a plug or a cord that goes in \nto it, but there's only one so we usually use these for dedicated \ncircuits if we have a refrigerator a dishwasher or disposal or something \nand we don't want something else   getting plugged in so that there's two \nloads being drawn in the same circuit We just put this in so you can \nonly plug one thing into it So this is a single receptacle. \nNext we have the GFI receptacle.   This is a ground fault circuit interrupter This is something that you're going to use in wet \nlocations like outdoors or in you know garages Utility rooms, kitchens, bathrooms, \nanywhere where you could potentially   have water on the floor and people could \nstand in that water and get electrocuted badly, so you're going to use \nGFI receptacles quite a bit And another thing a lot of people \ncall them GFI's they're actually GFCIs There are some people out there \nthat are very picky about you   calling it a GFI versus you calling it a GFCI a GFI is a ground fault interrupter a GFCI is a ground fault circuit interrupter Either way you go just know when you're going in that \nthis is to clear ground faults and   ground faults are something \nthat we'll get into in a later video but these receptacles GFCI receptacles are   used in wet locations. Next \nup is a single pole switch So a single pole switch you're \ngonna install so many of these again you can even imagine how many of \nthese you're going to be working on single pole switch is essentially just an on-and-off. That's all there \nis. It's either connecting or disconnecting a wire so you use these a turn light \nswitches on sometimes you use them as disconnects so that you can disconnect power \nto like a gas furnace or something like that but you'll use the crap out of these just remember   single pole switch means \nturning on and turning off Next in that same vein is the three-way switch a   three-way switch surprisingly does \nnot turn on three different things This was a hard thing for me as \nan apprentice to understand why,   it doesn't matter why I \nmean, you know how it works but it's like You think intuitively it should be called a   two-way switch because you can \nswitch from two different ways But that's not what it's it's for. So they call \nit a three-way switch. You can see that the terminals on the back are different. This \nsingle pole receptacle only has two screws You have your incoming hot and then you have the   the conductor that goes out \nto the light with a threeway you actually have three screws So you have a common screw \nwhich is where your incoming hot goes or you're outgoing out \nto a light and then you have two   travelers that get run between these two devices we'll go into this later You don't need to know that you just need to \nknow a three-way switch is a switch that's used when you're trying to switch the same \nlights from two different locations,   so it's not just an on and off. It's a Send current one-way and send \ncurrent in a different way,   depending on which position you switch this in Now another thing to bring up real quick before I   move on you see the difference \nbetween these switches, right? This is what we call a toggle switch So you there's actually a lever a toggle that \nyou flip this is called a decor or decora switch You have it's basically a paddle \nswitch of people calling that as well But they're just two different styles \nof switch. That's it. It's just a   visual aesthetic thing some people love this style They usually match these plugs They all have the same plates that go around \nthem because they're identical, same size So a lot of people like the style in their homes where a lot of other people like \nthe standard style where, you know, there's the round face on receptacles \nand the toggling for the switches Next up is the circuit breaker so circuit breakers are in every building \nthat you're gonna mess with so just understanding that a circuit breaker \nis the starting point of a branch   circuit and a branch circuit is what goes out to receptacles and lighting and everything \nthat comes out of the panel and feeds some kind of load. But the way that   you turn the circuit off is by \nturning the breaker on or off So this is just a standard single pole breaker So the next thing that you're gonna want to know \nis the arc-fault breaker. In dealing with homes we have these things called arc fault \nbreakers. They have this fancy little white pigtail that comes off of them. \nThere's a whole bunch of different styles There's different, you know \"combination \narc-fault\" that will do series and parallel   arc detection or there's just regular arc-fault but knowing arc-faults is a really \nimportant thing because there's very   specific rooms and locations and loads \nthat have to have arc-fault protection this is a breaker, but it does more than just test how much current is going through a circuit. \nSo it trips if there's a dangerous situation It also detects if there's any arcing \nhappening somewhere in the circuit so just knowing that arc-faults and circuit \nbreakers are essentially the same thing there's just a difference in why and how they   work and what locations are what \nbut we'll do more on that later Next is what we call out in the field, \ncarflex. Some people just call this flex There's a whole different series \nof names that you can understand   because there's three different types of conduits That kind of look very similar to this But this is nonmetallic liquid tight flexible conduit Meaning it's nonmetallic. So you can flex it.   It's liquid type meaning no water is \ngonna penetrate it and get into it and it's a type of conduit so you would \nrun conductors on the inside of this mainly we use these outside at Air conditioners when you're coming from \ninside the house where your wires emerge   out of the house and there's an \nair conditioner on the ground You're going to use this to hook up conductors so   that the conductors don't get wet. \nYou can't just run them in free air You actually have to have \nthem in some kind of conduit That's not the only place you would use these \nthere's a lot of reasons why you would use carflex But just know what carflex is \nand that it's used outdoors to hook things up around the house Alright, so since we just talked about carflex,   the next thing we should talk \nabout is carflex connectors. So there's two different styles of \nconnectors (actually there's way more   than two different styles) \nbut there's two different types to concern yourselves with \nthis is what we call a car flex 90 because it's a 90 degree connector. So you would essentially hook this up like this if the box that you're hooking up \nto is at 90 degrees. If you don't   have enough room to run straight into that thing you know like this would \nbe sticking out. This is a straight carflex connector \nand this is a car flex 90 So just know that there's two different kinds depending on what you have room for and \nwhere you're coming into an enclosure or a box next up is the AC disconnect. An AC disconnect is Generally used for hooking \nup to air conditioning units There has to be a means of disconnection or what   we call a disconnecting means - a \nway for a technician that you know maybe an AC guy has to go out \nand fix an air conditioning unit he needs to be able to pull power \nand disconnect that unit right   there at the unit so he can work on it and then reconnect power when he leaves Same thing for furnaces a lot of electric furnaces   use AC disconnects where they're \nnot really called AC disconnects We just call them that if you're at \nHome Depot, you might see some boxes Usually it's a 60 amp disconnect and \nit just says AC disconnect on it,   but they're used for a lot of different things sometimes they're used for water \nheaters, electric water heaters,   but just know what a disconnect \nis and that they're used to For a technician to be able to \ndisconnect power locally at an   appliance and work on it and then reconnect power that way they don't have to run \nall the way around the house try   to turn a breaker on or turn a breaker off and Then go all the way back and start working \non something and then Mr. or Mrs. Homeowner goes and flips that breaker for some \nstupid reason and shocks them while   they're working on it. Next up is the Bell box So a Bell box is a weatherproof enclosure that   you can put a receptacle or any \nkind of device a switch inside Of so, you would run usually on the outside of a house if there's brick   or something or a hole and then \nyou put a connector in here and You would screw this thing Into the wall, so it sits outside all the time It can get rained on and it's \nspecifically meant for wet locations So the Bell box is something \nyou use outdoors all the time. Alright and last on our list \nis the in-use cover. A lot of   people call these bubble covers \nbecause the cover is all bubbly Whatever you call it. It's actually called an   in-use cover but the idea \nis say you got a bell box or maybe you just have a regular box that you \ncut into a wood exterior of a house or something this goes on this, there's a weatherproof seal   all the way around so moisture and \nwater doesn't get inside of it and once your receptacle is installed inside, there's \nall these different inserts if you're using a plug You're using a switch or if you're \nusing maybe a GFI or a decor device but you're gonna have a \nreceptacle inside of here and This allows you to have a cord. There's a there's \na little knock out here that you can pull out that way you can have an extension cord or some kind of cord plugged \ninto the device and this thing will close while that is still plugged in it \ngives you a little bit of extra   room because that that plug is gonna be long and kind of cumbersome, so you \nneed something with extra room,   but the whole idea you just \nneed to know what a weatherproof bubble cover or an in-use cover is because you're \ngoing to use these again outside around houses gardens, all over the place. So that's it. That's \nmy list of I don't know, I lost count by now That's probably more than 25, but let me \nknow if you guys have any other questions There's definitely way more to know \nso I'll probably do more of these I'm gonna do some that are commercial as well.   But I just wanted to give some of \ny'all apprentices some understanding When you're first getting into residential of   what these things are called and what \nthey do and why you should know them You"

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"VideoID": "189",

"Title": "Good day of wire pulling. #electrician #electrical#construction @friendofconstruction7191",

"URL": "https://www.youtube.com/watch?v=DkAGlnwEJ8w",

"Keyword": "Electrical construction techniques",

"Transcript": "thank you you can't tell if it's even moving and you can see the wheels turn yeah that's what I'm saying now you can there it goes move over so you can show it going out this is a good day of fire pulling huh"

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"VideoID": "190",

"Title": "Electrical Box Extender Install",

"URL": "https://www.youtube.com/watch?v=2Eo9jwXEv1k",

"Keyword": "Electrical construction techniques",

"Transcript": "hey diy-ers here with another quick repair tip because your drywallers and your electricians screw up cut the hole too big set the box too deep didn't allow for it to be 5 8 drywall easy fix take your standard screwdriver remove the screws from the top and bottom of the plate take this plate with you to the Home Center so that you get a matching white one you want one that's oversized this is called a jumbo plate next go down the electrical aisle get box extenders comes a quarter inch 3 8 half inch go outside and turn the power off first take a Phillips take these bottom screws out then take the appropriate extender that you need slide it up over and behind push the wires back in using those same screws put them back in the same holes tighten them up take your new oversized plate put the new screws in there you have it they're screw up hidden and fixed if you want to see more quick repairs like this or other DIY quick tip click the link in the pinned comment and just remember if you build it or repair it it's DIY test till next time happy DIY"

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"VideoID": "192",

"Title": "Bathroom outlet | Electrical tips #shorts #electrical #homeimprovement",

"URL": "https://www.youtube.com/watch?v=gs792pSY0-Q",

"Keyword": "Electrical construction techniques",

"Transcript": " I personally kind of like my outlets \n out of the counter space could always plug in and have the cords, you know, kind of \n hang on a little bit below the the vanity. But I usually like to kind of keep them out of that space, \n but it's all personal preference. But you do want to try to keep this outlet \n a normal height, so 42 inches off of the floor \n would be your standard height. And then for GFI boxes, you can get \n the smaller boxes they will fit in there. But if you get the extra large boxes so they there's a little bit bigger, it will make it easier to fit a GFI \n in these bigger boxes. So right to the bottom of 42 inches \n is where typically you go. They have these little tabs on here \n that stick this out in front of a star a half inch for your drywall. "

},

{

"VideoID": "193",

"Title": "New Home Construction Electrician Tips",

"URL": "https://www.youtube.com/watch?v=\_MKclD1kTQ8",

"Keyword": "Electrical construction techniques",

"Transcript": "Five Star Electric your Myrtle Beach residential electric electrician for new home construction you can call us for all of your new home construction needs we always answer your call we offer convenient scheduling we show up on time every time most work is done in the same day and we have honest upfront pricing at Five Star Electric our goal is to achieve a five-star rating for our performance on every project call us today at 843-353-6345 or visit us on the web at Myrtle Beach electricians.com"

},

{

"VideoID": "195",

"Title": "electrician House Wiring work. #electrician #house #electrical #wiring #trending @electrician\_\_et",

"URL": "https://www.youtube.com/watch?v=\_Gz\_ti9tPP4",

"Keyword": "Electrical construction techniques",

"Transcript": "is [Music]"

},

{

"VideoID": "197",

"Title": "Electrical Panel Installation - Downey CA",

"URL": "https://www.youtube.com/watch?v=Ov0nuUewe5o",

"Keyword": "Electrical construction techniques",

"Transcript": "okay so this client wanted their office to have its own circuit breaker and after going in the attic and looking at the layout of the house this was the best option to run exterior conduit and go into the crawl space to a little j box and then romex all the way across to the main panel so there you go there's my romex connected it up to the only spare circuit breaker and that's it"

},

{

"VideoID": "199",

"Title": "Water In Electrical Panel! Easy Fix? #Short",

"URL": "https://www.youtube.com/watch?v=3Bhn4b27izw",

"Keyword": "Electrical construction techniques",

"Transcript": "you know what's not a good combination electricity and water so you could imagine i wasn't too thrilled to find out that my panel was actually leaking but if you have the same issue check one thing before you worry about spending all kinds of money to have an electrician fix the problem go to the outside of the house where the lines come in and in my case you can see there's this crack right here in this kind of putty this putty is called duck seal it's like three bucks for a brick of it seals up the lines on the outside and all you do is shape it around that crack and that actually stopped the water coming into the house obviously if you're not comfortable doing this same with any electrical repair call a licensed electrician to come fix the problem it could be this it could be something else but this is something to try that might save you time and money thanks for watching"

},

{

"VideoID": "201",

"Title": "Cooper Electrical Construction Capabilities",

"URL": "https://www.youtube.com/watch?v=k2QNi4IW4w4",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] just like electricity needs a strong connection for power to flow cooper electrical construction focuses on personal connections and information flow to power successful electrical design build projects and we rely on insight innovation and integrity throughout the process the flow starts with seamless communication and our powerful building information modeling bim is exciting to me because i'm able to see a project come together before it ever even gets built we have the ability to come in assist the client and assist the engineering team with designing the building we have an in-house bim team where we're able to do all the modeling and coordination next designs move into one of our pre-fabrication warehouses plans come to life perfectly measured cut [Music] packaged and sent to the building site we're fabricating conduit and equipment that normally would be done in the field we're doing that in-house so we're taking that work out of the field and doing it in a controlled environment and two of our warehouses during the building phase communication continues to flow rapidly and cooper's capabilities lead to safer work environments for everyone involved so when we're out in the field worker density is an issue so it's not just us on that project site we're working with other subcontractors so we have to look at mitigating the task we're performing as well as the tasks performed by others around us but when we pre-fab it we're able to mitigate all the hazards associated with that task and we're not worried about other subcontractors improve your personal connections and information flow with cooper electrical construction powered by success through insight innovation integrity"

},

{

"VideoID": "202",

"Title": "ICF Electrical Quick and Inexpensive Tools and Techniques",

"URL": "https://www.youtube.com/watch?v=niUkqDlKL1k",

"Keyword": "Electrical construction techniques",

"Transcript": "hi guys it's going to do a quick little video about some techniques and tools for doing electrical rough-in on ICF's walls most all the brands at ICF are similar enough that this will work you may have to tweak it just a little bit but I know there's lots of techniques out there that are really time-consuming and likewise there are some tools that are pretty costly and I don't see either one of them being necessary so just thought I'd share with you what I learned so first off the Box a use by these is an art there's lots of places to get them but it is this box here I don't know if you can see that tag but anyways it's an ideal size this nailing flange here on works really well and they're really inexpensive and easy to come by so you'll see that and that's worked well for me another thing is a homemade tool you'll see these for hundreds of dollars this is a fierce soldering gun that I think was $14 about 15 years ago you'll notice it is normally has a tip out here for soldering took these screws out to the soldering tip out took a piece of number 9 wire and bent this the shape and size I wanted and you know spend nothing just use stuff laying around and even if you don't have this stuff it's pretty inexpensive compared to the tools that you can buy that do the same thing but cost hundreds of dollars I'll show you what it how to use that in a minute another two this is a chief electric chainsaw that came from the nards I think it's 29 or $39 or something electric is really good for indoor use I can tell you from experience that you won't like it if you use your gas chainsaw and you're getting on the fumes any wheels will work a lot of Malawi or whatever I actually for this one with your shed and found a training wheel lots of my kids bikes they don't use training wheels anymore so that was a real I could grab build a hole in the Buller and both of this wheel through the bar there's lots of guys have different ideas about how deep the wire should be in the block that's a whole nother discussion but however deep you want it we set the distance between the wheels and the end of the blade of the chainsaw here and that'll set your depth so to the technique so what I do I just take an ax scrap the wood I've made it the size and shape that I want my boxes and it really helps me to go lay out where I want the boxes lay it up there trace around it with a sharpie back off and take a look make sure I like the layout before we start whittling and I see up but now this is cold so it's going to take a second to these up but here we go just put it where you want to top your box leave a trigger give it a minute to warm up the warmer it gets the faster it'll go you see it warm enough and melting through the polystyrene now I got that as deep as I wanted and I'm putting a little bit of down pressure on it and it's going down and then get the bottom and now I'm going to pull it out towards you so about to be instant you've cut there now this box I've set it up so this is the anchoring strip in the ICF and there you go I like put a screw in there when I'm done to help secure it but that tab actually will push in the foam and hold pretty good till you're ready to put the screw in now as far as cutting the wire channel you can see here this is one that's cut and you know the lomax you use it taste it shim or whatever you hook it in a little bit which is Pope's in favor of my card cutting that channel switch the cord over here chainsaw little electric then you saw how that is 20 times faster than doing that whole thing with a hot knife now as far as the wire goes you'll do yourself a giant favor if you'll set your up self up some kind of a real so that the wire comes off flat and straight if you're pulling it out of the side of the coil has all the kinks in it that will be taking a lot more time to get it straightened out and push in the kerf there so I come over about Oh eight inches or so past my box and test that and this is where we've got power coming into this box and go into an outlet and then likewise power going out of the box to the next outlet always trim off a little extra a whole lot easier then if you wish you had just a little more usually why this is a trim work throughout there so you feel that settles poked in therefore I want screw what screw gun over here but ones go through this nailing flange curl those out of the way cheap rockers bingo there we go so hope that helps y'all and saves you money saves you time thanks bye"

},

{

"VideoID": "204",

"Title": "I ripped out out the electrical wires!! Costly!!",

"URL": "https://www.youtube.com/watch?v=XLOiLDY59SE",

"Keyword": "Electrical construction techniques",

"Transcript": "so EPB in Chattanooga ran underground lines for me and as I was digging for sewer I decided to rip out that conduit and the wire with it so unfortunately about four trucks from EPB had to come out to fix that conduit they had to splice everything get it down rerun everything and put in two new Transformer boxes for me they got it fixed then MC Plumbing came out to connect my sewer for me so they got this all tied in right here and we actually ran the water lines down the wrong area so I had to re-dig a new ditch to the side of it five feet out got that fixed up got it here from the front as you can see and then we got it all covered up before the rain"

},

{

"VideoID": "205",

"Title": "CABLE TIEING ALL DAY LONG. #electrical #shorts #electrician",

"URL": "https://www.youtube.com/watch?v=lqLh1KdaSpA",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign [Music]"

},

{

"VideoID": "206",

"Title": "Electrical Tips #short #shortvideos #electricalshorts #electricaltips #wirejoint #electricalwiring",

"URL": "https://www.youtube.com/watch?v=RtLg2sW0CY0",

"Keyword": "Electrical construction techniques",

"Transcript": "are you sure [Applause]"

},

{

"VideoID": "207",

"Title": "How to Read Electrical Diagrams | Wiring Diagrams Explained | Control Panel Wiring Diagram",

"URL": "https://www.youtube.com/watch?v=s04vep-IqbI",

"Keyword": "Electrical construction techniques",

"Transcript": "in today's tutorial video we are going to discuss \nhow to read the electrical wiring diagram of a   machine this is Nadeem and welcome to my YouTube \nchannel before going further into this video   tutorial I would really appreciate if you guys \nwould like to subscribe this Channel and press   the Bell icon for more upcoming video tutorials \nreading an electrical diagram is really important   for the automation control and commissioning \nEngineers to understand how the input and output   field devices are connected to the controllers \nelectrical wiring diagram shows how the PLC   controller and field level instruments sensors \ntransmitter or vfds and motors are wired together   having the understanding of how to read electrical \nwiring diagram is really important to troubleshoot   the machine in today's tutorial we will try to \nlearn how to read the electrical wiring diagram   using a real word example for example if we have \na motor installed in the machine and if you look   closer we have a tag attached to the cable of \nthe motor with m142 mentioned on it now question   here is that where this cable is connected in \nthe machine electrical panel and how does the   PLC is controlling this motor for this we need to \nunderstand how to read the electrical diagram if   we see the sheet of the electrical wiring diagram \nevery sheet has a unique number mentioned on the   right bottom corner of the page so all cheats \nin the electrical diagram has a unique number   just like any Normal book next thing you can see \nat the top of the sheet this sheet is divided   into some vertical columns starting from column \nnumber 0 all the way up to column number nine   same way if you look at the left side of the sheet \nthis sheet is divided into some rows horizontally   starting from a b c and up to F these rows and \ncolumns together make a grid on the sheet this   grid makes it easier to locate objects on this \nsheet now we have some basic information about   the electrical diagram sheet next very important \nthing is that all fill devices wiring controllers   power supplies will be mentioned or represented on \nthis sheet in the form of symbols so before going   into electrical wiring diagram we should know the \nbasic symbols of the electrical devices like push   buttons contactors power supply and the motors \nnormally in in every electrical diagram at the end   of the drawing there will be few sheets showing \nall the items and the devices used in the project   along with their symbols so you can scroll down \nthe sheets and have a look on these symbols on   this sheet you can see that the symbols of the DC \npower supply power isolation switch motor and vfd   Etc coming back to the today's example as we \nhave seen previously the motor tag this motor   tag have a number m142 on it we will see now \nhow we can trace back the wiring of this motor   now we know that the tag number of this motor is \nm142 but where is this motor on the electrical   diagram how we can find out this motor on this \nelectrical diagram that consists of several pages   is if you see the tag number is 142 the first \ntwo digits are referring to the sheet number so   this means that this motor is on the page number \n14. the third number refers to the column number   this means that we have to look in the \ncolumn number two of the page 14. if you   see the column 2 of the sheet 14 here you \ncan find the motor symbol with Dag m142   as you can see that this motor is a three-phase \nmotor and its wires are connected to the terminal   strip inside the electrical panel you can see that \nthe three wires u142 v142 and w142 are connected   at UV and W output terminals of the vfd so this \nmotor m142 is driven by Omron vfd and vfd tag is   u141 next if you look at the top of the sheet here \nyou will see three lines these three lines are   the symbol for the three-phase power supply from \nhere the three fifth power is fed into the qf 142   breaker the qf 142 is a three-phase breaker with \nthermal overload protection in this breaker qf 142   case you can see that the first two digits of the \ntag are one four so this breaker is at the sheet   14 and the last digit is 2 means that this breaker \nis in the column number two of the sheet 14 from   the output of the breaker qf 142 three wires are \nconnected to the power input terminals of the vft vfds normally requires a run command signal \nfrom the PLC to turn on the motor the S1 is a   digital input terminal of the vft this terminal \nreceives a run command signal from the PLC if   you see closely this signal is coming from \nthe normal open contact of the relay ka396 mostly if any tag starts from the KA this means \nthat this is a relay or a small control contactor   to find out this relay we have to see the first \ntwo digits of the tag ka396 yes you guess it right   we will go to the sheet number 3939 and we have \nto look in the column number six let's go to the   sheet number 39. this is the ka396 symbol for \nthis relay coil it look like a rectangular box   you can see that one end of the coil is connected \nto the zero volts line and the other end of the   coil is connected to the number seven terminal of \nthe PLC output card number seven terminal is the   a05 output of the PLC and it is mentioned here \nas glue pump start command so now we know that   the motor m142 runs through a vfd with dag u141 \nand its vfd gets the Run command signal from the   PLC wire relay Ka 396 and this relay is turned on \nby the PLC digital output a 0.5 next we will come   back to the sheet number 14. we know that the vft \ngets a analog speed reference signal from the PLC   to control the RPM of the motor vfd have two wires \nconnected at FC and fr terminals these terminals   are the analog input of the vfd if you see the \ndrawing these two wires have tag 5210 and 5211   and these wires or lines have an arrow symbol \nat the starting point 52.2 and 52.3 is mentioned   near to these arrows what does this mean this \nmeans that these wires are coming from the sheet   number 52 so we will go to the sheet number 52 \nand here you can see that the wires 5210 and   5211 are connected to the analog output of the PLC \nthe brown wire 5210 is connected at the terminal   11 and 12 and the blue wire is connected at the \nterminal 13 and 14. if you look closely paw 276   is mentioned about these terminals which is the \nanalog output address in the PLC program handling   this particular analog output signal so this is \nhow to read the electrical wiring diagram I hope   now you have some basic information about how \nto read these diagrams I hope you liked today's   tutorial please do share like And subscribe this \nChannel and till next video take care and goodbye"

},

{

"VideoID": "208",

"Title": "Helpful tip installing outlet cover. #tile #electrical #diy",

"URL": "https://www.youtube.com/watch?v=ZJ1C1tdPkd4",

"Keyword": "Electrical construction techniques",

"Transcript": "a problem you may run into when you're going to put your covers on these Decora outlets and switches screws are on the outside right here my screw is going to hit that tile so let me show you what I did I can't use this option here because it won't cut it short enough so I'm going to use this switch and I'll just back it out and it'll save the threads"

},

{

"VideoID": "210",

"Title": "how to strip wire!The Lady Electrician ♥️ #electrical #shorts #newconstruction #residential",

"URL": "https://www.youtube.com/watch?v=goAkzUVykTc",

"Keyword": "Electrical construction techniques",

"Transcript": "[Applause] wait wait wait wait wait wait wait wait what [Music]"

},

{

"VideoID": "214",

"Title": "How To Wire A Main Electrical Panel - Start To Finish! NEATLY And VERY DETAILED",

"URL": "https://www.youtube.com/watch?v=hEDto-bnHKw",

"Keyword": "Electrical construction techniques",

"Transcript": "in this video i'm going to show you how to wire a main electrical panel the panel i will be installing is this 200 amp square d breaker box and if you're new to this channel my name is josh the channel it's all about building your own house saving tonight's be sure to subscribe ring that bell so you get notification every time release new video and hammer that like button for me that's all i ask in return for making this video so we got a lot to get into today so let's get started this breaker box is made by square d and it's a 200 amp 80 circuit 40 space plug on neutral box and it's the home line line and this is very nice because you will not have to use pigtails to hook up your neutrals [Music] so let's check out everything that came with this breaker box so we got some instructions we got this bonding screw you definitely want to hold on to that you may need it we got these lug covers um by code nowadays they want you to have these over these main lugs which is very important for safety and then what we got here at the bottom of the box looks like we got an assortment of breakers looks like we got a double 30 we got a single 20 single 20 single 20 and a double 30 and these are not arc fault or gfi they're just standard breakers and then if we set this out of the box this is our panel cover and obviously after we're done installing we will be putting this over it and this comes with the screws to anchor it to the actual panel box before you watch this full video for full disclosure i am not a licensed electrician in the jurisdiction i'm building this house in if i do my own wiring as long as it gets inspected it's totally fine so everything i'm doing here is going to be thoroughly inspected and with that being said i have wired four houses on my own and they all have passed inspection with no problem and i just want to let you know that so this video is for entertainment purposes only i'm going to be installing this breaker box in this stud space right here if you measure the width of this breaker box it's 14 and a quarter and a wall that's 16 on center is going to have 14 and a half from stud to stud so it's actually designed to fit right into a stud space comfortably and if you look here i got my seu cable coming in through the wall and if you need to know how to install your meter base and the seu cable i'll put a link up above here it's a video i made of me doing that so it's going to elbow up into the breaker box and now the breaker box can be flipped upright like this in most cases people think that the breaker has to be at the top of the panel but these square d boxes in this model can be flipped upside down or even sideways all right let's go ahead and prepare this box for installation if you're going to be installing this in a stud space like i am take note of the little holes that's up in the corners inside of the box there's one and there's one down here and then there's one back in this corner and there's one down in this corner and they all can be taken out by taking a screwdriver or a punch and just holding it right in to the hole and tapping on it it'll knock them right out the screws i'm going to be using to anchor this panel box these engine 5 8 wood screws with a washer attached to the end of them i know a lot of you guys know i work alone so i'm going to hold this panel box up in place the best i can and put a screw through the side to hold it until i get a ladder to finish the rest of the screws it's always fun laboring by yourself i always like to use a level to double check to make sure we're plumb and looks like it's pretty close let's go draw that screw in a little tighter first now i have the electrical panel set into place and as far as the height requirement goes the inspectors here don't like to see any breaker higher than six foot seven so that's just something to keep in mind check your local jurisdiction to see what you'd have to do if you go to install your own panel box all right let's go ahead and install this scu cable into this box next what i'm going to do is install this two inch clamp it's going to hold the scu cable so it's going to come up through the center here and if you lay it down into place it looks like this knockout right here needs to come out to accommodate this clamp so what i'm going to do is just take a screwdriver a straight screwdriver with a hammer and just tap it out now i'm going to take this two inch clamp slide it up into the hole and you want to make sure the screw heads are facing towards you so you can tighten it up here in a bit and then tighten up the nut that it came with then after that's tightened up you just want to take a bushing this is a two inch bushing and it just goes over the end of that and all that does is just keep those edges from damaging the cable going up through it now it's time to wrestle this 4 seu cable into that clamp this can be challenging because this stuff's like fighting a bull sometimes all right but we're not going to let it win today there we go not too bad this clamp requires a square drive and now i'm just going to hold that into place and tighten that up and you want to tighten each side equally so always draw each side down a little bit at a time all right that looks really nice now just go ahead flex this down a little bit and take a utility knife and we're going to strip that casing off just go through the casing just enough to score it pretty good don't press really hard because you'll cut into the wire that's underneath the casing here all right and after you get it started just start peeling it back and then i always try to get as close as to that clamp as i can get it to okay and always get this wrapper out of the way okay now what you need to do just go ahead and separate those wires and then twist all these loose aluminum wires together and it's going to create its own individual wire in this case here the red and black can be on either side so it really doesn't matter but what we need to do is go ahead and get those cut to length first so i'm just going to hold it up roughly where it goes and then go ahead and mark it with my utility knife where it needs cut that one's there that one's about here and whatever you do don't cut it too short and this one's going to be right in there and i gotta use pencil on this one because you cannot see a scoring on it now what i use is a sawzall this is actually a job max this is a small sawzall but it'll still do the job so what i'm going to do go ahead lean this over to where it needs cut and cut it [Music] so what i'm going to do now is strip the sheathing or casing whatever you want to call it that's wrapped around these cables so i'm going to hold them up about where they go go ahead and make a mark with the utility knife and just score the plastic on the outside and that way we know how much to take off and then to take to strip it i just put the utility knife into the actual casing and just go around it and just enough to score it pretty good and then after i do that i just put my utility knife into it just enough to score the plastic on it usually go lightly over it a few times okay and now let's go ahead and start prying that casing off and it'll should pop off and you know you'll get the feel for it after you do one now what i'm going to do is back these lugs out so that way they're not in the way when i go to install the cable into them and if you're wondering this allen wrench is a 3 8 inch size in case you buy this exact box that's what size wrench you're going to need okay and now what i'm going to do is i'm actually going to loosen up this clamp enough to drop this wire down a little bit just so i can slide them up into place all right so i'm going to just loosen that up some all right so so that loosens that wire up so we can work with it so now what i'm going to do is drop it down a little bit and then take this product this is called oxgarde this is an antioxidant compound that keeps these aluminum wires from oxidizing too much and then there's the other brand by ideal this is noah locks they're both the same stuff so either one's fine so we're just going to go ahead and take this little tube for convenience and we're going to smear some all over these cables here now we're just going to push them down and then slide them up into those lugs so once they're up in the lugs all the way just go ahead and hold some tension make sure they're up really nice and go ahead and snug these up and then just tighten up your clamp again and then we are now connected to the actual panel box and now let's go drive some ground rods so before i install any breakers in the breaker box i go ahead and get the ground rods drove run the copper wire and that panel box is on the other side of this wall so i'm just going to be drilling out through the side of this wall and running over to this first ground rod and this is going to be drove straight down and i got another ground rod here and it has to be at least six foot apart you can go a little more if you want but it has to be at least six foot apart so i guess idea so you get plenty of ground coverage so in order to do this we're going to come up here with these two huge hammers just kidding i'm going to throw this one down that's for later when you get into really tough ground so we're just going to go ahead and start driving it straight down like this slowly but surely so i'm going to go ahead and drop these down then i'll show you how to put the grounding clamps on after that [Music] so now that the ground rods are in i got to run a bare copper wire to the panel box this is six gauge copper wire so in order to do that i need to drill a hole through the side of the house to get outside so i'm just going to offset it right beside the conduit that's going up to the meter on the outside which is right here all right now we're going to go outside and hook this wire to those rods first and fish it into the house here's the hole we just drilled in the side of the house now the copper is going to run along this conduit into this little trench i dug and then here is the grounding rod that i just put in and it's going to follow this other trench six foot over to this other grounding rod i'm going to show you how to connect to these rods using these universal grounding clamps and i've just got this uh for only about i think they're about five bucks so i'll put a link in my description below to my amazon store where you can find a lot of the products i'm using for this installation first just take the grounding clamp back out the bolt that's on it and then slide it over the ground rod and then take your bare copper wire and i got 25 feet here which i didn't need that much but they were out of the wire that's on a spool anyways so just take the copper wire and just pull out a couple feet of it here and then take it and make a little bend in it like a hook almost something like this and then slide it down beside the grounding rod so that way it kind of hooks on to it something like that and then just go ahead and tighten up that clamp this is just a half inch socket to tighten it down all the way and don't ever tighten it to where you strip it out and now just go to the next one and do the same thing so here we are clamped to this furthest ground rod then it runs over to the one closest to the panel box and just an important note you do not want to cut these bare copper wires you want to keep it all one whole strand don't splice it together or anything and then we're just going to fish the rest of it into the house i'm going to leave those grounding rods uncovered until inspection and they should be about a foot below grade by the time it's backfilled just so you know i know some of you guys are probably wondering is it okay to use number six copper to ground a 200 amp panel well in my jurisdiction it is but be sure to check your local building codes because some areas require number four copper which is a bigger gauge than this number six so i just wanted to let you know that before you go out and buy number six copper for your panel always check your local building codes in order to get the ground wire into the panel box there's a little knockout right there go ahead knock that out and sometimes you can push them out they're not secured very well and we're going to fish it right up into that hole all right so we're just going to fish it right through there and as you can see there's ample amount of room to get the ground through and now what we need to do is cut it to length so it should go to about the top of that lug once it goes in there so we're going to go ahead and snip it about right there and this is soft copper so it cuts really easy so now what we need to do is back out this slotted lug right here so let's get a straight screwdriver back it out some and now fish that ground wire right up into it and now after it's up in all the way go ahead and tighten that down since this is not coming from a disconnect or is a sub panel i got to install this bonding screw into this hole right here so in order to do that you just take a square drive and just simply slide it into that hole and keep tightening it down until it is snug and that just bonds the panel box and everything together so before i get a bunch of home runs coming down through here i'm going to go ahead and take this half inch drill bit and drill about 10 holes through this wall where the double plate is here because it's way easier to do it now before you have a bunch of wires in your way and you got to risk damaging the wire so i'm gonna do that and install a board going across this stud space because i gotta anchor the home runs 12 inches from the panel box so i'm going to put it here about six or eight inches and so that way we know we're good and then they're going to have them run down into the panel box from there let's go ahead and do that [Music] so now above the panel box is ready for the home runs and below what i got to do is secure this scu cable against this block of wood again within 12 inches of the panel box and then we're going to address this hole here in just a moment so to do this i just get a piece of strapping and a couple short decking screws you don't want them too long where they go through the side of the house so all we got to do is strap it just as if you're going to strap any kind of plumbing or duct work so we're going to get one side started here now i'm just going to put tension against that scu cable go ahead and draw this screw down and now that's going to be held securely before it goes into the panel box so we like that and always put the ground into that same strap just kind of keep it looking nice and organized so now what we're going to do is take this duct seal and pack it into this hole so we got a nice weather tight seal and this stuff can be found in my amazon store just check the description below if you need to buy it so you simply just take this like a piece of play-doh kind of stuff it in and seal around that hole and the reason why we had to wait is because we needed to secure this first up here because it's going to manipulate this a little bit and we don't want it breaking the seal so i'm just going to simply stuff that into that hole so up to this point the bulk of the panel is set now we need to run home runs and get ready to start installing breakers after that pretty sweet and simple [Music] [Applause] here are all the home runs that are going to be coming through the top of the panel box each one of these are going to be secured using a romex connector now this is a 10 3 wire this 10 3 wire is going to be secured using a three quarter inch rim x connector and it's going to have to come through a three-quarter inch knockout in the top of the panel box and this 10-2 wire this 10-2 is going to be secured using a 3 8-inch rim x connector through a half-inch knockout and then each one of these 12-2 wires can be doubled up and they also are secured using a 3 8 inch romex connector coming through a half inch knockout so we're going to go ahead and fish these down through the wall and secure them to the panel box next all right so what i did i went ahead and knocked all the knockouts out first and then i knocked this three-quarter inch one out for the 10-3 wire and i probably could have got away with the 3 8-inch remx connector but i figured why not since i already had one here so in order to install the remax connector just place it into the slot with the screws on the outside of the panel and then you simply just take the nut push that on to the rim x connector so it's going to look something like that when it's installed and as you can see it's nice and secure and now for these 3 8 inch remex connectors i use these they're the snap lock version they don't use the nut so to install these just place them in the hole and i usually take a pair of needle nose just kind of roll them back and forth until they snap into place about like that and they pivot so it makes them nice and flexible so you can twist the wires a little bit if you had to but as you can see it's nice and secure and that's what it looks like from below and again these can be found in my amazon store as well so now i'm going to fish the wires down through into these remex connectors after i put all the remx connectors in these knockout holes because there is so much information in this video i decided to put time stamps in the description below there you can jump to different scenes such as how to install ground rods or how to install scu cable inside your panel box that way it'll help you save time instead of watching the whole video just to find certain sections you need [Music] now it's time to focus on taking the jackets off each one of these home runs and i'll show you how i keep them organized so in order to strip them like i do is put your utility knife into the casing or jacket whatever word you prefer to use and just go down the home run nice and easy don't don't push down real hard to where you cut into the conductors inside the wire all right so now all you gotta do is pull that jacket and now it's gonna go up to where it's cut right like that and be sure to get the paper off too as well because there's paper around the bare ground and there's a paper around the whole wire so just go up there take your utility knife and cut away from the wire don't cut towards it you might cut into the wire then what i do is take the end of that casing and cut it off and that has the label for that run so the piece of the jacket that has a label for what that circuit was i'll go ahead and take that and slide it back over the end of the black and then just make a little hook so that way it doesn't fall off now i know what this circuit is and all i got to do is go through and do that to all these home runs [Music] there is such a tool called a remx wire stripper and i have not used it before i have always used the utility knife when stripping these home runs but i'll put a link to it in my amazon store if you want to check it out again i'm not sure how well it works but i'll put it out there for you [Music] now that i got all the wire strip that's going to be coming into the top of the panel i'm going to show you how to install first a double pole 30 amp breaker for the hot water tank just a little word of advice be sure to wear safety glasses when you're working in a panel box you got a lot of wire swinging around your face when you're roughing it in and you don't want to get poked in the eye those little copper wires are very sharp all right let's get back to wiring the panel box before we get started installing this double pole breaker here i wanted to let you know that this wire here is shorter than normal that's because i ordered it too short to begin with to be honest with you so i let the most i could out by with a hot water tank so what we're going to do first is go ahead and take off our label and now these are the wires that we're going to need to wire into the panel box so the first thing i do i'll go ahead and take the breaker and go ahead and install it to where it's going to be permanently installed so what i'm going to do is clip it into place and all you got to do is line up these little notches with this little notch here on this plastic bar and then just slides over these two prongs and just so you know this panel box is not live obviously because we're just now installing it so if this was a live panel be sure to kick your main breaker obviously but just a word of advice and again seek help from a licensed electrician if you're not comfortable with any of the stuff seen in this video all right so now we're going to go ahead and slide that over to where it goes all right so that's slid into place and now what i do i'm going to go ahead and bend these wires here up into the corner then they're going to come down and angle right into the breaker so go ahead and bend them into place so now we gotta cut these wires to length so all you gotta do is cut them about right in this area just enough to slide into the breaker so about right there so go ahead and clip it there and now go ahead and take your breaker out all you gotta do is pull this way on it and just kind of rock it out of there just like that and i'm going to use a pair of these wire strippers and to use these all you got to do is line whatever gauge up wire inside of whichever groove is associated with that so there's my 10 wire slot so i'm going to slide that right over the wire i usually take about a quarter inch off all right now we take our breaker and use a square drive and back out these screws and just so you can see what i'm doing here if you look inside this breaker as you can see there's these metal brackets that's where the wire slides up into so if you back this out you can see it opens it up and allows a wire to go into place all right now just slide the white in where we had it originally placed and tighten up up that screw on the breaker that's just going to wedge it so it's secured then do the same to the black wire slide it into place then tighten up that screw all right just like that and that's what's going to look like so you got your wires that's wedged under each one of those screws and then just reinstall it to where you originally had it and now this copper wire goes into this bar here so that so you know this is going to act as a hot wire versus acting as a neutral i know it's colored white like we're used to seeing but it's actually a hot wire all right so now this ground we're just going to go ahead and cut that and put it into place as well so something like that's fine it's going to go into here so go ahead and back out the screw to where you want to place this and then after that screws backed out place your ground wire into that bar like so and then tighten it up all right so that's how you install a double pole breaker and again this is two hots here all right now let's install an arc fault breaker after i install each breaker i like to keep the panel box door right beside me while i'm working so that way i can just open it up and then right here on this side inside the door is numbered spaces and over here there's numbers beside each space and it corresponds with each other so i installed that hot water tank up here so i come over here to the top right hand side then i'll just pencil in hot water on each one of those spaces so that way i know this numbered space corresponds with this numbered space so i never lose track of my circuits now we're going to install this 20 amp arc fault breaker this is what it looks like out of the package and i'll show you up close what we got here how this is different than a usual breaker if you look here let's zoom up close here so you can see so right here is where the hot wire is going to go in which is the black it slides in there and gets clamped down and then as you can see here this little silver area that silver area is where you're gonna back out that square drive screw and slide your neutral into there so these are plug on neutrals which is really nice so if you look here that's going to hit the neutral bar or clamp down on to it and then just like a standard breaker that's going to hit in the back of the panel which is going to energize the circuit so it's pretty cool design and if you've been following my channel this is that first circuit that i ran to the room on how to wire a house so now you're going to see how it's hooked into the panel box so the first thing i do is i'll go ahead and install this breaker or not really install it as much as just clip it into place so we'll go ahead and squeeze that onto the neutral bar and then bracket it into where it goes so right like that again it just kind of plugs on hence the name plug on neutral okay now what i do is i'll go ahead and address this white wire first so i'm going to go ahead and tuck this up into the back of the panel box just like i did the other breaker we just installed it just gives it a nice neat appearance and i'll go ahead and turn that towards the breaker so i know it needs cut about right here so we're going to snip that now and we'll do the same thing with the black one now so we'll go ahead and push that up into the corner just so we keep everything nice and organized looking and something like that all right then go ahead and clip that to length and now we're going to take our wire strippers and this has the gauge like i said and this is 12 gauge so we slide it into this 12 slot we'll strip about a quarter inch or so off that that looks good do the same to the white and now let's address the ground same thing slide it up into the corner and then we'll go ahead and turn it into and towards the bus bar so we need to clip it about right there and we'll go ahead and snip it and then what we need to do is we'll go ahead and pull this breaker out okay and we'll install the wire in the corresponding slot it goes and these are just square drive screws as well so we'll go ahead and back that out and slide that into place now we'll do the black next same thing just slide it into the slot it goes in the slot i just showed you up close a moment ago hold it into place tighten down the screw all right then always double check to make sure they're in good yup that feels really good and now we're just going to install that back to where we took it out of there we go that looks good and now for the ground wire same thing we'll just go ahead and back out this screw slide it into place and then tighten up the screw and now i just tuck these wires in to make sure everything looks nice and straight all right and that looks pretty good and now that's all there is to installing an arc fault breaker again very easy to do the plug on neutral keeps everything real nice no pigtails so up close that's what it looks like installed there's the ground wire and here's how you kick the breaker on and off pretty simple and straightforward i wanted to make sure i showed you that arc fault only breakers are going to have a white test button and the gfi plus arc fault breaker is going to have a purple monthly test button and just so you know they're wired exactly the same so if you know how to do an arc fault you know how to do an arc fault gfi combo breaker these are the lug covers that came with the panel they're real easy to install these just slide over the cable and then this goes over the lug so just like this pretty simple and then each one gets it and it's a nice safety feature that way you don't accidentally bump into these even though the breakers off these are still going to be hot fyi now that i showed you how to install these couple breakers i wanted to show you what i like to do with my ground wires i'll go ahead and take every ground wire run them into the back side of the panel like you see here and start plugging them into this bar so that way it keeps them all looking nice and organized and tucked away in the back before i start running my blacks and whites and as you can see here i have all the wires stripped and ready to go and i have them tucked to the side here so that way they're not in a way as i try to install all of my breakers and you might want to do things like this like uh put i have this extra ground wire that was left over from the grounding rods and i used it just to hold the wires back so i can work in the panel and i also like to show you i always keep a place for trash and a place to put the scrap copper so in case you want to turn that in for scrap metal you can and then i'll have my panel box cover right here to the side so i can fill it out as i go and then i have my breakers sitting right here so i can just reach down grab them and keep running the circuits so i have a nice little system going and it keeps things flowing well and right here i wanted to point out to you i had to bracket and secure each cable 12 inches from the box so i went ahead and done that and then put some strapping here to keep things tucked away and then up above the same way i went ahead and stapled all the wires going across and put some nail plates here to protect those wires from any kind of nails or screws the drywallers might be in placing into the wood and now what i'm going to do i'm going to go ahead and keep running these breakers and i'll show you what that looks like when i get towards the end and these cables here are for a sub panel so i'm going to show you how to do that as well [Music] if you're curious to know how much time i had from the time i started this video to ending it it took about two days it took me one day of actually putting the ground rods in putting the scu cable in the panel box setting the panel then about another day hooking up all the breakers and putting all the final touches on everything i figured you'd want to know that information [Music] [Music] all right this is what i got done so far and i wanted to show you something that's unique if you look at this dryer breaker this is a double 30 just like the hot water tank that was a double 30. if you remember right i got the white for a hot and a black for a hot then the ground went to the bar and now if you take a look at this dryer this is a double 30 also but you have a red that acts as a hot a black that acts as a hot then you also have this white that goes into the neutral bar and you also have its own ground that goes into the neutral bar so that's a little different this is ran with 12 3 wire just so you know for the dryer and now this is what i got done so far like i just said and i wanted to go ahead and wire up this 100 amp breaker that's for a sub panel and i wanted to show you something here i had to add a neutral lug here now what this does it ties into both of these screws and gives you a bigger area to fit this larger neutral wire into so i'll put a link in my amazon store to where you can buy one of these but also this is the ground that's for this 100 amp cable as well well for this 100 amp circuit this is number two aluminum wire and as you can see it has a ground a neutral and two hots and this is going to be for the sub panel in the detached garage when i go to build it but i'm going to wire it now because it's way easier to do it now than later is going to ultimately go into the crawl space and terminate into this box this is a junction box and we're going to transition into conduit and then run it outside under the ground into the detached garage when i get to it but this is just a clamp that's going to hold it into place and again that's in the crawl space but i want to go ahead and show you before i installed it under there so i already clipped the 100 amp breaker into the panel box so i'm going to do now is address this neutral wire first so like i said i already got the lug installed so what i got to do is go ahead and bend that back into the panel box where i want it and always like to try to leave plenty of excess in the panel box if i can but let's see if we can get that place to where we want it here and these things are pretty stiff wires it's a little cool out today so it's a little harder to work with them compared to normal so we want to clip it about right there so i'm just going to take my pair of wire cutters and then go ahead and snip that off right there so now what i got to do is take a utility knife come back about a quarter inch and just cut around that casing all right now all we got to do is flex this into that lug so we'll go ahead and wrestle with it here a little bit and get it in there all right now kind of hold it in place and tighten that lug down and now when you tighten this stranded wire down you're going to have to snug it up as best you can then after it's snug give it a little wiggle and re-tighten it down and that's just because those strands will separate some whenever you wiggle it so go ahead and wiggle it again and then tighten it down one more time all right and now the next thing we need to do is do the same thing for the hots i already got them this top one the length and then this one looks good as well so same thing we got to cut about a quarter inch back off the sheathing and now i'm just going to back out the slotted screws that's on the 100 amp breaker then we're just going to place it into the breaker and then hold some tension on it and then tighten that up and again tighten it up give it a little wiggle and then tighten it again [Music] for those of you who have installed sub panels before let me know how your experience was with that in the comment section below [Music] all right now we got a 100 amp breaker that's going to feed our sub panel in our garage and again here is the powers this is the neutral coming in and then here is the ground for anybody curious about the 262 wires in my breaker box they are for my hvac units one is for my outside unit and one is for the inside furnace and the outside unit could have got away with a 40 amp breaker but i went ahead and put the 60 they said that was the max amperage breaker i could put in there just for anybody curious and the other inside unit breaker is a double 30 ran with 10 2 wire all hvac units are different and require different size breakers and wires so i just wanted to put that out there this is not a universal setup you see here now that all the breakers are installed in the panel box it's time to work on this panel box cover so all you got to do is anywhere you have a breaker come over here and take the corresponding twist out in the location in which our breaker is going to be placed and there's something unique here in this situation if you remember i started from the top and was working down and this cover came missing one and two here so i'm going to have to get what's called plate fillers and they just go over these areas they're little black pieces i'll show you a little picture here that's what they look like and they just snap in and just fill in these places where they're missing the twist outs so i'm going to show you how to take these twist outs out and install this cover in order to remove these twist outs you simply just take a pair of pliers kind of grip onto it and then push back and then wiggle it back and forth and then just work it out just like you would any other knockout but this is called a twist out and then pull it and now you got a space ready to have a breaker installed okay i just set the panel box cover over the breakers and it's hard to record it so i just went ahead and placed it on there so now the screws that came with the panel box are right here it's these they look like that and now each one of those goes into the holes that's in the middle in each corner of the panel box cover and they just take a square drive as well the same square drive size that the breakers used then you literally just place the screw into the hole and tighten it up not very complicated the only thing out of this whole process that wasn't very complicated after you get all these screws on that's going to hold the cover on let's take a look inside this is our ledger that tells us where the breaker is located for what circuit as you can see i still need to get these filler plates for these two locations here here's the main breaker to kick the whole house off and on is right here and that is what's going to look like on the inside nice and clean and that's all there is to installing a panel box and i just wanted to let you know that for the dishwasher i need to get what's called a padlock attachment and what that does is lets you lock out that whole breaker so if you kick it on it puts a padlock so you can't turn it off or on either way and uh that's if you're working on a dishwasher it's safer that way for the electrician and the same thing goes on the hot water tank but that's going to be a for a double breaker which is a little different lockout all right guys i want to say thanks a lot for watching i hope you learned something be sure to leave a comment below if you have any questions about this video and i'll see you in the next video have a good one"

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{

"VideoID": "216",

"Title": "5 Tips for basement electrical to pass inspection",

"URL": "https://www.youtube.com/watch?v=f7MX7PTZgRM",

"Keyword": "Electrical construction techniques",

"Transcript": "hey guys this is brain bed for and I've been working on my basement this winter and I wanted to go over a few things that I've learned specifically around my electrical a few things that I wish someone would have told me I've ran twelve twelve to two all the outlets and fourteen - OH except for this outlet that's what's 14 - but all of the other outlets were 12 - you can see all my hellos around here they're all 12 - wire all the lights are forging - and then but a few things that I learned however talking with the inspector and stuff oh I passed my 4 way inspection so everything that I've done here is good it's all in the clear so that's that's a good thing anyways the first thing is make sure you put in these little adapters first so the payment and pain-in-the-butt should have to do after the fact which is what I had to do so that's like so put those in go cheap the second thing is here where I have all these wires sticking out the inspector set he passed me but he said it would have been better if I would have bunch these together and tied it up it was in bed everybody said this was fine because my fire blocking is holding it in place pretty firm the next thing is with the electrical is down here with the electrical box you have to put in a staple within six inches of the box so it secures the wire in place so it won't get bumped and moved in and cause problems so that's a few things that I learned another thing is you can't put a receptacle in with your HVAC system learn that oh here's another one if you cut a hole in your stud and it's load too close to be outside I think it's like an inch and a half inch and a quarter or something then you have to give a nail plate and that bed just protects from the sheetrock screws but this is bringing at the farm in a quick little update about my basement electrical thanks for watching"

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{

"VideoID": "218",

"Title": "⭐️Construction Tips😁#shorts Owners Need To Know",

"URL": "https://www.youtube.com/watch?v=ek7MnLN80GM",

"Keyword": "Electrical construction techniques",

"Transcript": "this is a Federal Pacific electrical box right here see there's a stab lock right there these are not being accepted by any insurance companies so if you want to get your building insured and you're a landlord and you have electrical panels like this you're going to need to rip them all out and you're going to upgrade it to a new panel now you can go online and you can find out what panels are acceptable and what panels are not that way you know what panel to install but I hate to break it to you California it's the new law"

},

{

"VideoID": "219",

"Title": "Contractor Lead Generation: How I Get Customers for My Construction Business",

"URL": "https://www.youtube.com/watch?v=lEaJgxbdUFs",

"Keyword": "Electrical construction techniques",

"Transcript": "a lot of contractors ask me how do i find jobs you know how do i get more customers and i tell them that you don't really find jobs unless you're like working for the government or working on big commercial projects where people put out a listing and then you submit a bid along with 50 other companies that's the only case i can think of that you're going to find customers normally for the average contractor the remodeler electrician plumber water well driller these kind of people get found by customers when they're looking for them right and in the old days before the internet this was all done by word of mouth so joe schmoe would want a remodel and he'd ask his neighbor or his friend or his family member hey do you know any good contractor and then they would either get one of two answers they'd get sure i know a great contractor contract this guy or they would get the horror story of oh yeah i worked with a contractor last year and he burned my house down and fled with my wife or you know whatever there's either horror stories or good stories but these days word of mouth is slowing down a little bit it still works and by all means it should be one of the ways that you get customers if you're not getting customers by referral then you're probably not doing a very good job because if you do a great job people will hire you back and they'll tell their friends and family about you because it's tough to find a good contractor and you know this isn't some kind of minuscule transaction like you're inviting somebody into your house they're working on your home which is probably the largest investment you've ever made and you have to live in it all the time so it's a pretty big deal for people and my family or my dad started a remodeling company about 25 years ago and i'm in my mid-30s so i worked on that thing for almost the last 20 years and 10 or so years ago we used homeadvisor i'm sure you've heard of homeadvisor and uh we would buy leads from them and 10 15 years ago it was great we used to get a ton of ton of you know contacts every week we only paid like five or ten bucks for them and we got a lot of work from it but as time went on the you know more and more people that we called wouldn't answer their phone and the leads got more and more expensive and we even found that we were getting a lot of other contractors information or we were getting people that already had a bid and they were just trying to verify the price you know we were getting all this stuff that just completely wasted our time and drained our bank account so we had to look for other ways and you know back in like 2013 2014 things were pretty slow and that's when we created our website um we built a really ugly old website but back then we were like the only ones who did it in our area so we got tons of customers from that and that really kept us busy for a few years but just like homeadvisor over time it started to dwindle and dwindle until we weren't getting very good results from it and that's when i out of necessity learned about this stuff and i learned that the reason that we weren't getting found through our website anymore was because there was a bunch of other contractors in our area that built better websites than us and they were showing up on google on the top of the first page and so they were getting all the phone calls people weren't looking at the second or third page of the google search results and finding us so i had to figure out how to a get my website to look professional and look modern and show up well on these smartphones you know and b i had to make sure that people could actually find us when they were searching so i spent hundreds of hours thousands of hours at this point learning how this stuff works and applying it to our our own business and after some time we were able to get phone calls coming in again and at this point in time we're booked out for about the next two years we haven't even accepted any appointments in the last few months because we're just so busy and all of these people are finding us through google and our website and over the years you know i didn't want to spend all my time doing this so i put together a team to do it for me and once i had this team i was like well i have all this potential here but i mean my project's pretty much on autopilot at this point it only takes a few hours a week to maintain it so let's help some other companies out there and so for the last few years my team's been working with contractors all over the country doing the same thing that they that we do for me which is build a professional website make sure people can find it on google the only other step really is to get some good reviews so that when people go and find you on google they can read some positive things about you and compare you to your competitors and hopefully get a pretty good message you know about you but you can still use things like homeadvisor and if you take a look at google search you'll see that homeadvisor angie's list thumbtack porch house yelp better business bureau all of these companies which i call lead reselling middlemen companies they dominate the first page of google and these companies main goal is only to collect people's contact information so they can sell it to you that's the only value they add and they don't want you to know that if you just had a professional website and made sure that you were found on google you wouldn't need them you can get these phone calls directly from the customers without having to pay per lead and they're also a lot better because if you buy a lead from homeadvisor they're selling it to five other contractors at the same exact time so you're instantly competing with six other contractors on top of that people that put their contact information into home advisor are not necessarily ready to even talk to anybody homeadvisor does not make it clear exactly what's going on you click onto their website they're going to ask you for all of your information before you even see anything they make it sound like you're going to see a list of contractors so you can compare and contrast them but really you don't get to see anything until you've put all of your contact information on it and as soon as you hit send on that form your information is being sold to multiple contractors and not even only through homeadvisor but angie's list owns homeadvisor now so they share the same contact information so looking at page one of google you've got all of these companies that are almost pretending to be contractors so that they can get contact information to sell it to actual contractors and the thing is is if you're an actual contractor you have a huge edge on these companies if you just get a professional website and a google maps listing if you can be found with or above these companies in the google search you're going to get loads of phone calls and i'm not exaggerating you know our clients get hundreds of phone calls every month and you know we don't we only get maybe like five to ten a week but that's way more than we need and way more than we want quite frankly so you know this is where it's at um compared to you know getting your own leads compared to buying them you know there's just a ton of benefits to it first of all the lead quality is way higher you're talking to people that found you that already vetted you they're almost ready to hire you already all you got to do is get them through the process when you get a lead from home advisor you're calling them along with six or five other people they're not even wanting to talk to anybody and that's why most of them don't answer the phone number two is you you control it if you have a website and a google listing and everything you can control the lead flow you can you can turn it up you can turn it down you can use advertisements with homeadvisor you're getting what they give you at any time they can remove your reviews or they can let somebody post a fake review about you they can change their policies they can raise their prices like you have zero control over what home advisor does so if your business is relying on them then you're pretty much at their mercy and so i mean it's pretty clear for me and i'm trying to get this word out there because i get so many calls from people that are like oh should i use homeadvisor or should i use angie's list or should i use this or that or this and look they're they're all the same they're just companies that are desperate to grab people's contact information and sell it to you and you pay the prices it's it's very expensive for them to show up on the first page of google they pay for advertising they invest heavily in search engine optimization which is what's required to get their website to show up and they pass these costs on to you and that's why their prices go up year after year after year so look that's how i do it that's how most successful companies do it there's nothing wrong with using homeadvisor but it shouldn't be your main source of new customers so if you have any questions you know leave them in the comments um also i'll leave the link to my website in the description so if you want to learn more about what my team can offer you head over there and thanks for watching"

},

{

"VideoID": "221",

"Title": "Heated Flooring Testing Tips #diy #electrical #shorts",

"URL": "https://www.youtube.com/watch?v=VeVWvHNf2l4",

"Keyword": "Electrical construction techniques",

"Transcript": "As you need a multimeter, okay? And you want to put this on the 200 reading. You can see that. Okay. So put it on that setting\nbecause that will give you the readings that you need to look on there on the wall\nbefore you even take it off. Don't even take the cellophane off of it. There's always a white tag on this thing. Okay. And what it's going to give you is\nfour is the resistance range. It'll give you a range. So this one and this all depends\non the size of rule that you have. One says between 22 and 48, there's a black and a white\ntend to have one on each side and then you want to test\nand see what this is. So we got 34 or a 34 basically, and we had to be in between 22 and 48. Now, you're going to want to test this\nmultiple times throughout the process. So once right on the roll, once when I get\nit fixed up and I have the line run, and then once after the tile installation\nor after the floor level or."

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{

"VideoID": "222",

"Title": "Construction Top Tips - Electrical Safety Tip 3",

"URL": "https://www.youtube.com/watch?v=clARhEmp5UA",

"Keyword": "Electrical construction techniques",

"Transcript": "If we pick a house for instance and there has been a number of people that have been injured and killed working in and around houses. Quite often the risk is from the condition of the cabling in itself. So there are a lot of older houses that have split conduit in it, the conduit’s become live – there have been people in the past that have come into contact with the conduit and were touching a metal roof sheet at the same time, so they got an electric shock from the conduit, through them and into the roof sheet. There’ve been other occasions and certainly when they went through the insulation program, years ago there was a part about people putting insulation into ceilings and stapling into cables – so again that’s another issue that people need to think about because they don’t look at them. We also have cabling that quite often gets chewed up by rodents – rats and mice love plastics, so they’ll chew all the plastic off and in around the hole where you get up into the ceiling space – I’ve been into ceiling spaces where the top of the cable, there’s no plastic on it because they’ve chewed it off and the top of the cable happens to be the active. But similarly I’ve also been to other houses where old rubber insulation underneath a veranda – and rubber is one of those ones that doesn’t like heat. So over time it crumbles and falls off, and so I’ve been under a house where the only bit of insulation was where the little brass clip was that was holding the cable up and you just had two bits of bare copper that are running in between the clips. So certainly what type of cable is in the house, what is the condition of the cable – so they're the things you need to consider. And then what is it that I’m going to do. If I’m going to drill holes, what’s in there? So am I potentially drilling into a cable? So mostly if we’re just looking at a house, the best thing to do is to turn the power off. So whether it be lights or power – again depending on how they wired the building – these days with a concrete slab all of the cables come up through the ceiling space, where an older house where it’s on stumps, quite often the cabling will come in from underneath. But, if somebody doesn’t know, best thing to do is turn the power off. Have it confirmed that there is no power out there and then they can go and do their job – so then they’re not at risk."

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"VideoID": "223",

"Title": "SHED OFFICE ELECTRICAL #electrician #handyman #electrical #residential #bluecollar #quality #working",

"URL": "https://www.youtube.com/watch?v=wbwBKHz3B1g",

"Keyword": "Electrical construction techniques",

"Transcript": "up to the panel I had an inspection today so we're all good for all the roughing including the underground so here it is made it up good got my grounding electrode there expansion fitting all right so we got switches there coming in it's got porch lights and got interior lights so there's going to be four LEDs in here it's uh eight by ten by twelve I think this is um and got receptacles all around"

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{

"VideoID": "226",

"Title": "The BEST WAY to Set Up an Electrical Panel",

"URL": "https://www.youtube.com/watch?v=IdZphSsvVRc",

"Keyword": "Electrical construction techniques",

"Transcript": "what does the average breaker service in total amp is like 25 is it 50 well most of your Breakers will either be uh 15 20 or 30 amp that means that when you blow the breaker it means you got too much ampage going correct so the key thing is like okay on one breaker I'm going to put one Appliance I'm not going to put my stove I'm not going to put my HVAC I'm not going to isolate the breakers based on the number of appliances you have right what's the best way to set up a panel by a professional electrician godamn right h"

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{

"VideoID": "227",

"Title": "Five Tips to Get Your Resume Noticed From Electrical Construction Recruiter, Kait McCoy",

"URL": "https://www.youtube.com/watch?v=bfh2WM7MQWU",

"Keyword": "Electrical construction techniques",

"Transcript": "hi my name is Kate and this is Kate quick tips this week's topic is resumes number one make sure you include all of your past employers even if you're only there for a couple of months number two make sure you include all information pertinent to your position for example if you're an estimator make sure you include what kind of software you use number three make sure you highlight your achievements number four make sure you include your education including licenses degrees certificates number five make sure you use reverse chronological order so your most recent position is at the top of your resume and last but not least have someone look it over if it's a family member a recruiter a friend you just want to make sure there are no grammatical or spelling errors that's it for Kate wig tips thank you so much for coming and I'll see you next week"

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{

"VideoID": "229",

"Title": "Don&#39;t Waste Electrical Wire - Home Building Installation Tips",

"URL": "https://www.youtube.com/watch?v=hjqMZJGHlCE",

"Keyword": "Electrical construction techniques",

"Transcript": "here's something you're not going to see very often in the construction industry and that of course is the waste of electrical wire as you can see right here we've got probably about four or five wires coming and dropping down and making a large loop that to me seems very unnecessary all of these wires could have easily dropped down into the top of the box and as you can see there is a lot of waste and wire I would just guess there's a bout looks like we got about a three-foot loop there and about seven wires so we've got about 20 feet of wasted wire so and it's not just wasted wire don't forget it takes more amperage takes more power to drive the electricity through longer wire so shorter is going to be better so view guys and gals out there have any idea why somebody would have done something like this I would love to hear from you again we can all learn from these videos including myself but if it was me I would have ran all of these wires into the top of the box and that would have been the end of that"

},

{

"VideoID": "232",

"Title": "Electrical Outlet Tips",

"URL": "https://www.youtube.com/watch?v=Jpu-3zB8Pqs",

"Keyword": "Electrical construction techniques",

"Transcript": " Okay. So the client \n wanted me to turn around this outlet. The face inside of the bathroom. So these are these old metal boxes. They're real pain in the neck to you. So if you're going to change this around, \n I recommend getting a four by four box like this and get a plaster guard \n to convert to a single box. This will make it easier to convert. So we're going to go \n turn off the breaker. There is. Since I don't know where these actually \n go, I'm going to be putting drywall in. I want to put an outlet on there. Yet they're kind of pigtails together. Just prep them for the outlet. And since this is a metal box, \n you want to use some ground screws. "

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{

"VideoID": "233",

"Title": "Quick Connect Electrical. Are they a good idea? #shorts #tutorial #short",

"URL": "https://www.youtube.com/watch?v=7EvpY7dzEAY",

"Keyword": "Electrical construction techniques",

"Transcript": "another daily tip when it comes to replacing an outlet or switch you have a couple options and today i'm going to show you why i don't use the backstabbing option or some just call it a push connect as you can see in this demonstration it's not perfectly tight and can move around versus using the screw which we know is tight if it's not tight it can get hot and burn but for all the sparkies that say push connect is okay are you okay with using these inside of a box versus a wire nut personally i'm not but i'd love to hear your opinion"

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{

"VideoID": "234",

"Title": "Electric pipe fitting in house#shorts #electrical #home",

"URL": "https://www.youtube.com/watch?v=hRsPyN2Z1nI",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] thank you"

},

{

"VideoID": "235",

"Title": "765KV TRANSMISSION LINE CLIPPING #construction #transmissionline #electrical #construction #viral",

"URL": "https://www.youtube.com/watch?v=C94uSvNQDXg",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign [Music]"

},

{

"VideoID": "238",

"Title": "Lamberts electrical tips and tricks",

"URL": "https://www.youtube.com/watch?v=7MBCZBxnucs",

"Keyword": "Electrical construction techniques",

"Transcript": "we got a little trick for you today guys how many times you get on a job site and you ain't got enough reel Transporters and the guys are whining I need real Transporters well I got a simple solution for that half in Rage two gang ring flip your reel on the side stick your ring in the center run your four screws down into the [Music] reel like so Center The Reel flip it back over on the side that you just put the r on un loosen your VX there you go on re transporter reel transporter from the five and dime"

},

{

"VideoID": "241",

"Title": "Learn About LATTC&#39;s Construction, Maintenance &amp; Utilities Pathway",

"URL": "https://www.youtube.com/watch?v=drO66xQSgvk",

"Keyword": "Electrical construction techniques",

"Transcript": "so reflecting back on the beginning of the program learning every component of building a house from the foundation up to where I am now doing an internship with a major construction company and from going from literally knowing nothing to being able to build a house from the ground up just stuff I never in a million years I think I'd be able to do well what is a construction maintenance and utilities pathway everything that you live and work and go around we have the architecture program from the beginning of design it's been to construction we have the carpenters and the cabinet makers and the finished carpentry program and the internal parts for the Mechanicals so we have the plumbing the air conditioning so we train in all those areas trendtec has taught me that I'm a much better student than I ever thought I was I can do the reading I can put in the work I have a tremendous sense of Pride and satisfaction and I'm gonna graduate and get my associate's degree that's something that will change my life forever you know I can take this this education and go anywhere in the world and use the skills that I've acquired here at Trade Tech foreign"

},

{

"VideoID": "245",

"Title": "Electrical pipe work |#shorts #youtubeshorts #shortvideo #viral #construction #subscribe",

"URL": "https://www.youtube.com/watch?v=q5Csl3Rv8QM",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] till you come like [Music]"

},

{

"VideoID": "246",

"Title": "Removing old mains cable #electrician #sparky #electricity #electronic #electrical #timelapse",

"URL": "https://www.youtube.com/watch?v=DEgyR5Xs3hA",

"Keyword": "Electrical construction techniques",

"Transcript": "that's what this good old boys gonna go out working on [Music] working on jesus kicking the bottle wrestling with our roots trying to turn obama's tears and feel our daddy's bones shutting off our pride bricks and bridges we burn"

},

{

"VideoID": "247",

"Title": "Electrical hack #electrician #hack",

"URL": "https://www.youtube.com/watch?v=tKMjdH5MyZQ",

"Keyword": "Electrical construction techniques",

"Transcript": "all right thanks for tuning in show you all electrical hat see it's hot oh we're circuit tracing can't find the damn circuit show you a fancy trick here got our gloves on I'm gonna trip it out and find it all we gotta do is go to the panel find the trip breaker we're good to go"

},

{

"VideoID": "248",

"Title": "Electrical tips #shorts #electrical",

"URL": "https://www.youtube.com/watch?v=QQA\_RorNIYo",

"Keyword": "Electrical construction techniques",

"Transcript": "waste my time what you know about rolling down in the deep when your brain goes numb you can call them mental freeze when these people talk too much but the and so emotional i feel like a nation"

},

{

"VideoID": "250",

"Title": "400sqmm LT Cable Laying Tips / Electrical Work In tamil / Dilip Select Electricals",

"URL": "https://www.youtube.com/watch?v=GXmT4bntYQs",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] he"

},

{

"VideoID": "253",

"Title": "If it looks burnt, just don’t worry about it #lifehack #electrical #construction",

"URL": "https://www.youtube.com/watch?v=9R6IQ5UukWU",

"Keyword": "Electrical construction techniques",

"Transcript": "you guys want to see a new life hack come on over here I'll show you one you got an outlet you plug your stuff in it just keeps falling out falling out this is how you're gonna fix it you ain't gonna have to replace all this you're gonna take your thing you're gonna squeeze it in then that bit's in there a little bit you shove it in there and there you go stays right in"

},

{

"VideoID": "254",

"Title": "Electrical Safety Tips At Home Electrical Safety Rules Video Part 3",

"URL": "https://www.youtube.com/watch?v=z23Wt\_qm3XU",

"Keyword": "Electrical construction techniques",

"Transcript": "when dealing with the panel box make sure that you use Extreme Caution never work with a panel box that doesn't have a cover on"

},

{

"VideoID": "256",

"Title": "ELECTRICIANS TIPS AND TRICKS, Labeling the panel #oddlysatisfying #electrical",

"URL": "https://www.youtube.com/watch?v=5NfH0xS-4mo",

"Keyword": "Electrical construction techniques",

"Transcript": "one of the most important things is labeling a pan labeling a panel so I have what all the circuits are in here so the first thing I do before I even take the panel cover off to start work I label each one 1 2 3 4 5 6 7 8 9 10 what have you each one of these wires were labeled the same way well they don't go in in the same order sometimes they're a little goofy so I know when I land them breaker I had wire one two three four six seven and so they all coincide so when I label the panel I know that my bottom one was number one kitchen lights so as simple as that but that's how you keep it neat and clean you don't have to go in there with a tester or something like that and ring out the house to find out your circuits that's the first thing most important tip you can ever do when doing a service upgrade it label the panel first it saves a lot of Hassle and a lot of time"

},

{

"VideoID": "260",

"Title": "Proper looping electrical wire new formula #electrical tips #electrical#electricalshort",

"URL": "https://www.youtube.com/watch?v=AGmcL-FGbD8",

"Keyword": "Electrical construction techniques",

"Transcript": "I know [Music] yeah [Music] I can do this every morning every evening if you screaming straight back to Sunrise foreign"

},

{

"VideoID": "264",

"Title": "Bethany talks about the Electrician – Construction and Maintenance Apprenticeship Program",

"URL": "https://www.youtube.com/watch?v=PORNW8wrXKQ",

"Keyword": "Electrical construction techniques",

"Transcript": "(upbeat music) - My name is Bethany Davis and I chose the 309, a construction and maintenance electrical\nprogram at Conestoga College. I'm in my first term of school\nfor this apprenticeship. I chose it because I learned\nby working with my hands. And I like that I can continue to make money while I'm working. Some of the highlights are\nworking on a bucket truck in my first term, it was\nunexpected, but it was so fun. Also learning about how electricity works, the theory and how to use the\ncode book has been something that's been really fun. I'm on track to reach my goal to write my certificate\nof qualification by 2023. And then from there, I'll\nbecome a journeyman electrician and just continue to work. It's been a great career choice so far. It's very rewarding. And the reason that I believe\npeople should consider the trades is because trades\naren't going anywhere. We're always gonna be\nbuilding and innovating and there's always gonna\nbe a demand for the trades, not only a demand, but at\nthe end of the work day you're really happy and proud\nof what you've accomplished. Often, I'll point to my children as we're driving by and say,\n\"Mommy installed those.\" And it's just a really great feeling. (upbeat music)"

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{

"VideoID": "266",

"Title": "Electrical Panel Is On Fire.....In A Good Way #shorts",

"URL": "https://www.youtube.com/watch?v=FvrRUEkBSmE",

"Keyword": "Electrical construction techniques",

"Transcript": "hey everybody Daniel here from Five Star Home Inspections just wanted to show you this nice electrical panel nice work on a new construction it's not always bad love how they've got the Romex separated with these wire holders everything's real clean everything is really shapely easy to see I like it"

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{

"VideoID": "267",

"Title": "Averill Electric Employs the Advantages of Prefabricated Construction",

"URL": "https://www.youtube.com/watch?v=QcxQHGT3nrA",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] so [Music] do [Music] so [Music] so [Music] [Music] [Music] [Music] do [Music] you"

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{

"VideoID": "275",

"Title": "How To Excel As An Electrical Foreman: Top Tips | Estimateguard.com",

"URL": "https://www.youtube.com/watch?v=f9UV-4Klqlo",

"Keyword": "Electrical construction techniques",

"Transcript": "I get this question a lot the shortest path to this goal is to take my beginning and advanced form and training here on YouTube links are listed in the description below but if this is your goal here's what you need to understand the company you work for exists to make a profit without profit that company will cease to exist so if you want to impress your company you need to make them money the more money you make them the more successful you'll be there are a couple ways you can accomplish that goal first you can yell and scream all day and tell everyone to hurry the hell up and as long as you can stand over them and stomp your feet you'll have success but nobody is gonna like you very much including yourself or you can use a more scientific approach you can understand your numbers and the tempo of your project this will enable you to actually steer your project to a profitable conclusion people will admire you for your ability to manage a project instead of forcing and jamming it through by whipping the backs of your crew every day when you go to work you swim in a sea of mediocrity yes there are good and capable men and women out there but most only do what they have to do and then go home and forget about work so it's easy to get ahead of the vast majority of them if you want to be the best you have to do more you need to make an investment in yourself literally so there you are standing at the crossroads right now pick your direction success takes effort when the other guys are home drinking beer you need to be learning something this is where most guys and gals drop off most people want success but they don't want it bad enough to earn it life always gets in their way so you're gonna need some discipline you could take some college classes that's easy enough just go sign up the problem is they don't offer a degree for managing Crews at the site level most people who take the college route step up to an office level position as a project manager and still don't know how to manage a crew in the field successfully if that's your goal then you know what you need to do if not and you actually want to succeed at managing crews in the field then listen up let me ask you a question the last time you completed a project for your company did they tell you how you came out financially do you think they were honest about how well you did that question always bothered me because there were many times when I felt like I really hit it out of the park and what I heard was man you really got close on that one but we just didn't quite make our margin that can be heavy news if you really busted your butt to beat that budget especially if there was a bonus tied to your success this is why it is so important to know your own numbers in fact if you do not know and understand your own numbers you're letting your entire team down from the president of your company to the green horn on your crew knowing and understanding your numbers as your project unfolds enables you to make calculated decisions that will provide profitable results on time completion and consistency in your success ratio your company desperately needs you to know and understand your numbers now here's the reality your company doesn't know you need to know and understand your numbers remember that guy or gal who went to college and took that position in the office as a project manager manager your company believes that they can manage your crew from the office and they are wrong I've been in this industry for 45 years over the last decade or so I've seen companies strip Foreman of their responsibilities and tried to manage these numbers from the office with the Advent of computers and specialized software companies have come to believe that they can manage their projects without your help I'm a big fan of computers and software the you and your crew are the ones in the field turning the screws and you have huge control over their success or failure because of that they need to include you in the management of their numbers otherwise their project manager is just farting in the wind if you want to reclaim your responsibilities manage your numbers and help your team and your company to succeed then you have some learning to do you need to understand the role of the estimator and project manager so you'll understand your own role you need to start with my beginning form and training if you're already a foreman you still need to take my beginning form and training because I'm going to teach you how the numbers are created why they are important and how to use them to manage your project you'll find the link in the description of this video get started right now absolutely free as my contribution to the industry I love"

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"VideoID": "276",

"Title": "#myNCstory - Niagara College Electrical Techniques program",

"URL": "https://www.youtube.com/watch?v=n9OcOZoIgEc",

"Keyword": "Electrical construction techniques",

"Transcript": "(upbeat music) - Electrical techniques program is a one year certificate program that gives the students some hands on and employability skills. - I originally chose it because I came here for an open house originally and I met some of the teachers and I realized just from the environment, and how the teachers were acting, that it was probably a\nplace I wanted to be. It seems like it's one\nof these environments that if you have a question, they definitely have an answer for you. You don't have to feel like you're trying to pry it out of somebody. So it seems to be really good dynamic between the teachers and the students. - This program here is\npretty much all hands on. There's of course, there always is your academic portion of it, but most of this program is hands on. So they get a lot of work with their hands to understand how things work and how things are put together. We have a great facility,\nour equipment's up to date, it's what they will be\nusing out in the field. - It was more the teachers that caught me over the academics originally, but not that I'm in the program, I mean it's such an immense program, you learn so much that\nit's really been rewarding."

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"VideoID": "277",

"Title": "All-female construction crew leads electrical construction work",

"URL": "https://www.youtube.com/watch?v=3QzdWPBf8eM",

"Keyword": "Electrical construction techniques",

"Transcript": "welcome back to good morning indiana it is 6 14 and march is women's history month and so megan this morning we're highlighting the wheeler mission center for women and children right here in indianapolis that's right the transitional facility it's meant to help women and children experiencing homelessness is under construction this morning i'm introducing you to the women lighting up the building before anyone steps inside off michigan and lasalle streets you'll see construction work on the wheeler mission center for women and children it's going to be really great for people and families that need that and if you talk to the people on the property you'll meet three women behind all of the electrical work including leslie hawk right now i do anything that alexis and lori tells me to do she's the apprentice in the group of ladies including alexis mitchell and lori griffith they basically are trailblazers and i feel lucky to be around them and learn from them even though she's new she's learning quickly manual dexterity and then you use your mind a lot of course there is some some labor to it watching these people i will never complain because they never do and they just get it done nearly one year into this 19 million dollar project they've wired most of the 164 new permanent bedrooms here it's like doing a connect four or something alexis mitchell's the journeyman electrician she brings eight years of electrical experience at construction sites we're used to just working with a lot of men mitchell says even though fewer women work in construction she's found it sparks her passion after a few years in college i went for engineering but i didn't want to do the designing i wanted to work with my hands it's just the right outlet for her in an example of women making science in technology engineering and mathematics knowledge literally light up a room we're all the same and we're capable of doing the work it's not as hard as people think it is we can do it they do some work you see like wiring card readers for doors or smoke detectors on the ceiling lighting the way for the team is lori griffin me and my younger years i hardly ever saw another woman she says women have come a long way in the construction industry women can do construction you know sometimes it's nasty and dirty but if you have a mindset there's nothing stopping you i mean you can you can become the boss if you want and she is a boss she leads all of the electrical work sometimes it's kind of hard for women you can't be dainty griffith's put more than 25 years into building respect with construction men it's kind of like brother and sister now you know they joke around but they they go out of your way to help you we'll go out of our way to help them as part of the ibew 481 union 2 these ladies say they're getting equal pay we make what the guys make there might be one difference between the women and men we have a women's portalet so with a lock on it so we don't have to worry about that potty humor aside all of the women have dug up disparities there's three of us here and you know what they pull their weight and thrown them aside when it comes to electrical construction this job was meant for me i mean being an electrician these female electricians are amplifying the message that women can work along the same frequency as men in the construction world it was great meeting all three women and to become an electrical construction worker it takes five years of schooling at least but these women tell me it's a stable job that's looking for more women and continued even during the pandemic lauren"

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"VideoID": "280",

"Title": "You Must Know - Complete Basics Of Electrical Engineering - 3D Animation",

"URL": "https://www.youtube.com/watch?v=zYRMn8g43mc",

"Keyword": "Electrical construction techniques",

"Transcript": "Let's take a simple wire, it can be of any of copper or aluminum or silver, we will connect 5 volt battery to this wire and also a bulb, when we turn on the switch, the bulb will turn on and current will start flowing. The current that is flowing here in wire, basically electrons are flowing through the wire and the flow of electrons is called current. Now let's assume that if we cut this wire from the middle, then there will be no way for the electron to flow, which means that no current will flow. So always keep in mind when we check the current with multimeter then the current can be checked only when a load is connected, if the circuit is open somewhere then the current cannot flow. Now the current that is flowing through the wire, the same current will flow through the multimeter, only then the multimeter will be able to tell how much current is flowing. That's why we connect the multimeter in series with the wire, then the multimeter checks the flow of electrons and gives us the information of the current And the device with which current is checked is called Ammeter and ampere is the unit of current. But this multimeter performs the work of many meters alone. Now the voltage is always written on the battery which is installed here. Voltage is an electrical pressure which forces the current to move forward. If we plug the multimeter directly into the plug, it will tell us the voltage, which means that the volt meter is always connected in parallel. The phase wire has 220 volts and the neutral wire has zero volts. Until the load is not connected, the neutral wire only provides the return path to the 220 volts coming from the phase wire, so long as the switch is closed and if you touch the neutral wire by hand, you will not get current. When the multimeter is touched to these two wires, the multimeter will show us the voltage difference between these two wires. Resistance works In the same way as Friction does, for current the friction work is done by Resistance Whose only work is to cause power loss. Now every metal has resistance, some less, some more, that's why copper wire is used in the main wiring in our homes because its resistance is less, due to which it will be less hot. And if the heat is less then it will be able to carry more load. Now resistance also has some brothers and sisters, which are called impedance, admittance, reactance, they also do power loss but in a different way. Now a very famous Ohm's law is formed by combining voltage, current and resistance, which is called voltage = current \* resistance in short. Now suppose that there is a circuit in which many bulbs are connected in series, if the wire breaks anywhere, then all the bulbs will go off because the current will not flow beyond this point. So can we say that when the connection is connected in series then the current is same in all the devices connected to it. And the second biggest thing, like 2 ampere current is flowing through this wire, then half ampere will be divided in all four bulbs. Now the current is divided which means all the four bulbs will light up weakly. Now if we connect these bulbs in parallel, then even if the wire breaks from any of them, there will be no difference on the rest of the bulb because the path of current is made to move forward. That's why wiring in our homes is done in parallel And its biggest advantage is that all devices work well. Now the biggest confusion is about power, voltage current is okay, what is power, basically power is the product of voltage and current. Like this bulb is of 5 volt and when it is on, it consumes a current of 2A, then its power consumption will be 5\*2=10 watt. Watt is the unit of power, but the device which rotates like motor, their power rating is mostly in horse power i.e. hp, it is just a difference of saying and both HP and watt are the same unit of power, How many watts are there in one HP? Must write in the comment. Now this bulb will consume 10 watt power but in how much time ? So when it will be on for one hour, then it will consume 10 watts, which is sometimes written as watthour. When it is 1000 watts, we can call it 1kw or it can also be called a unit. When the device is made, its power consumption is set according to its use, which means power is fixed for any device, we cannot change it. Now we have 2 types of current, alternating current and direct current, whose waveform is of this type, first of all let's talk about alternating current. The 220 volt supply that comes in our homes is AC only, the flow of current in it is of this type. This is a cycle which is of 360 degrees and in 1 second such 50 cycles are complete, which we call the frequency of 50hz.\n Hz is the unit of frequency When we get an electric shock, this current does not want to twist us like this 50 times in 1 second, but our body does not move so fast, then we get a strong shock and if it is left for too long, then we can die. Let's assume that 220 volt supply is given in this wire and current is flowing, now the thing is that current is not visible to us with eyes, it can only be felt, But something else is happening around this wire which we cannot see. This 220 volt supply generates its own field near this wire, which is called magnetic field. You must have heard people saying many times about the high voltage line, don't go near it, otherwise it will pull you towards it, then let's understand the reason behind it. This is a spring-loaded road which is moving in this way. There are some air particles on both sides of this road on which it exerts force from its moment. Now this road is moving only in this distance, but if we observe the force of air closely at this position, then we will feel the force of air a little. Exactly the same happens with alternating current, when this waveform travels in this way, it charges the air particles that are near it. And when we go near them, we do not need to touch this wire, we get electric shock from far away. But there is nothing to be afraid of, which is a high voltage line, it keeps the area around it charged, the supply that comes in our homes is safe. Another advantage of alternating current is that it becomes zero at this point, so by chance we get an electric shock, then we are left at this point. Now AC supply is also of two types\n single phase or three. Single phase supply comes in our houses, which is of 220 volts, in which there is a phase and a neutral wire, we keep getting those shocks. But three phase supply is of 440 volt which is for big machines like big motor or Or for Salman Khan because there is a song in Salman Khan's Sultan movie, Lag Gaye 440 Walt Chhone Se Tere which means salman khan was talking about three phase supply. Now all the voltages which are more than 440 volt like 11000 volt which are written as 11kv in short, above this 33kv 400kv 765kv they are not used anywhere. This high voltage is used only to save the losses, because the power station is very far from our homes, so if the electricity travels so far, there will be lot of losses on the way. That's why the voltage is stepped up to a higher voltage with the help of a transformer. Now let's talk about DC supply. The current of DC supply is of this type, which is absolutely constant, our smartphone, laptop, apart from this, all the electronics items run on almost DC supply. Now its waveform is very straight, which means that there is no frequency in it, if there is no frequency then there will be no magnetic field near it. Means magnetic field is near it but when the wire will act like a magnet only then. DC current can be stored in a battery but not AC current but it can be converted to DC or reverse. There is a small question for you, which device converts AC to DC, what is it called, must write in the comment. DC current is much more powerful than AC, if DC gets shocked then there are less chances of survival and more of death. But don't worry 12 volt dc which is in battery is not so dangerous. If there is any DC current more than 50 volts then it is very powerful and can harm us a lot. 12 volt DC is also very powerful, if you see the size of the cable attached to the 12 volt battery in vehicles, then you will know how powerful the current is. Day by day population is increasing, so power consumption is also increasing, so according to the demand, power companies keep installing new generators in their power plants to increase power generation. We are the end consumers of electricity, but the journey from electricity generation to our homes is very complicated and long Because electricity does not tolerate carelessness at all, if there is a mistake in the middle, then its punishment is met immediately. if you want to make your carrer in 3D then we will design 3D animation course in simple language in hindi. Details are avilable in description you can join. Thanks for giving your valuable time to this channel."

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"VideoID": "281",

"Title": "⚡💧 Electrical &amp; Plumbing Installation For Cob Buildings",

"URL": "https://www.youtube.com/watch?v=HCJGArOVVkU",

"Keyword": "Electrical construction techniques",

"Transcript": "okay so in this video I'm gonna show you the basic concepts and principles for installing electrical into cob and these principles apply it to earth and building in general so there's basically two ways you can install your electrical lines you can either have them exposed on the exterior of the wall using conduit so for this strategy you would complete the table walls and then at the end you can also carve out a small channel in the wall and then put your wire in that channel and then plaster over it so they're not seen that's another way to install your electrical at the end of building the walls now the other option is to have your wires integrated inside of the wall and this is it it's more difficult to do this because you have to install your conduit in the walls as you're building them up so you're gonna have a lot of conduit spread out all over your your project throughout the building project it's just a lot more complicated but it is possible so those are the basic ways of installing your electrical now you can have your electrical boxes and your outlets installed either embedded into the wall or on the exterior so you could have a you can carve out a box or you could frame in a box as you're building the wall up a lot like you would frame in a window and then you would install your box into the wall or you can have it attached on the exterior same with the electrical outlets you can have them on the exterior hooked up to your conduit or you can carve out carve out little boxes to insert to help us into so if we're plumbing and bringing water into the building you want to run your water and let's underneath your foundation and up into your building so the key thing to know here is not to run water pipes through the cob walls or any kind of personal balls because if you have any kind of leak you're not gonna be able to get to that leak and repair it and all that leaking water is going to totally soaked and destroy your wall so don't ever install water pipes into the cob walls always have them running underneath the wall into the building and then going to whichever rooms and areas we need there's one strategy you can employ and that's to for example you could create a conventional stick frame wall between two rooms that require water such as a kitchen and a bathroom so that dividing the wall between those two rooms can be made out of stick framing just conventional framing and then you you run your water pipes and your electrical through that stud frame wall and then out to the adjacent rooms this way you can cover your pipes so they're not are not showing on the exterior of any rooms and that going underneath the floor if you don't want that but if you have any problems you can much more easily get into that stuff in wall to make repairs as opposed to trying to get into an earth to water so that's one strategy you can use it's it's a bit of a compromise as far as the natural building goes but it's something to keep in mind"

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"VideoID": "282",

"Title": "Earthing Systems vs Electrical Grounding - Difference between Earthing and Grounding",

"URL": "https://www.youtube.com/watch?v=UKlvFfj2yZU",

"Keyword": "Electrical construction techniques",

"Transcript": "One of the most misunderstood and confused\nconcept is difference between Grounding and Earthing. There is no major difference between earthing\nand Grounding, both means “Connecting an electrical circuit or device to the Earth”. This serves various purposes like to drain\naway unwanted currents, to provide a reference voltage for circuits needing one, to lead\nlightning away from delicate equipment. Even though there is a micro difference between\ngrounding & earthing. In this video we will go to show you difference\nbetween earthing and Grounding. Earthing means connecting the dead part (the\none which does not carry current under normal condition) to the earth. For example electrical equipment frames etc. Grounding means connecting the live part (the\none which carry current under normal condition) to the ground. For example neutral of transformer, 3- ph\nstar connection etc. Earthing work in under fault condition these\nparts may attain high potential earth. so any living being touching these parts will\nbe subjected to potential difference which may result in flow of current of such a value\nwhich may prove to be fatal. Grounding is done for protection of power\nsystem equipment and to provide a effective return path from the machine to the power\nsource. Earthing is to ensure safety or protection\nof electrical equipment and living being by discharging electrical energy to earth. During lightening dangerous high voltage can\ndevelop in the electrical distribution system wires. Grounding provides a safe return path around\nthe electrical system of your house thus minimizing damage from such occurrences. Dear sir, Thanks for watching the video. For more update please subscribes our channel\nLearning Engineering, and to get notification press the bell icon."

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"VideoID": "283",

"Title": "Making some electrical upgrades on a vacant house. #HandsomeOrHandy #Handyman #Electrical ￼",

"URL": "https://www.youtube.com/watch?v=9GQLaZ-ywRU",

"Keyword": "Electrical construction techniques",

"Transcript": "no we had a house become vacant that needed some electrical work at the same times the neighbors paid a surveyor so we're gonna Mark the concrete so that we know where the property line is even after that Peg disappears normally we like to trench an underground electrical but we don't own the property between us and the pole so it was kind of impossible get to the top of the mass put another strap on and then we got to run the wires through get the wire shoved up we're gonna bend them over put the weather head on and then get everything terminated in the meter socket we're using aluminum wire between the meter and the overhead lines get everything cut and landed in the meter socket you may not be able to see it but we are using Dielectric grease on these aluminum wires you had everything buttoned up and then head inside previous tenant had some LED light strips which I found out you can activate with static electricity as you can see in the basement we got the old panel to the left and the new panel on the right only a panel upgrade but we got a bunch of new ground fault outlets New Light in the kitchen new furnace and we've got everything inspected so done with this and on to the next project"

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"VideoID": "284",

"Title": "Haters Will say it’s fake #electrical #electrician #tradesman #diy #lol #funny #work #ansell",

"URL": "https://www.youtube.com/watch?v=XwP1OwdxoJY",

"Keyword": "Electrical construction techniques",

"Transcript": "will we need a bigger ladder well it would need to pick a lot of he's only gone and done it nice little Ansel light up there well done Ryan got long arms honey"

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"VideoID": "286",

"Title": "Construction Electrician",

"URL": "https://www.youtube.com/watch?v=r9rA92HcAlI",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] foreign [Music] electrician is someone who deals with various types of electricity like residential commercial high voltage low voltage heating lighting communication there's all kinds of different types of it that they can do such as limited to one basically they're going to install conduit install electrical wires electrical equipment basically anything that has to do electricity on the job site chances are it's a construction electrician that's going to put it in especially when electrician is like one of the most important trades out there think of yourself and all having power during a storm basically everything that we do derives from electricity a typical day for myself as a construction electrician I would typically go to the job we would go over a safety sheet and go over all the tasks for that day what's the potential risk to watch for and safety practices to follow the PPE that's required it all depends on the kind of job you're doing or what area you're doing so if you're getting into a house if you show up to the house you start putting your boxes on then you drill your hole start pulling your wire all the way through do your connections if need be at that point if more commercial you might be pulling armored wire so 630 we walk into the job site grab your tool bag talk to your Foreman or your journeyman to find out what it is that you're working on that day because we have an apprentice and then we have a journeyman and then we have myself which is another Apprentice all working together so we basically go to a journeyman we say hey like what's the plan for today and he says okay we're going to pull this circuit and I need you here you need you here and we just start going to work safety is the biggest thing like following safety all the time when you're working construction I give everyone their tasks for the day what they're going to do and how who they're going to be working with if there's other Journeymen on the site or if it's apprentices and make sure everyone's comfortable and they're aware what their task is instead of just overseeing all that I get to work on my own tasks or I'm answering emails or dealing with the other site supers phone wire there's heavy lifting and stuff like that so you can be mindful of how you're lifting the techniques and all that that go into it so you're not hurting yourself in the long run so when you when I started out I went to pre-employment at the college the one-year course to give you what you needed as an electrician to go through everything there was and then after that you started working and then you did a series of blocks so there's four blocks total until you started right seal you can get indentured at the beginning if you want where you don't have to go to school if you have some kind of background in like of trades or anything or like your hands on you already know about tools and stuff you'll get sent away to school and it's around two months finished school you'll write a block exam and then if you pass the block exam you move on to the second or the third level depending on where you end up there's tons of work in New Brunswick as long as you're willing to work you fun we're pretty much anywhere I took a year off high school first and then I took the pre-employment course for a year in Moncton I wrote my block one and then I went to look for work I found work right away I think part of it was because I was in this network for women in trades the personalities required for this jobs would be like an outgoing personable person someone that gets along well with others because you're always whether you're working on the job on your own and there's nobody with your company there but there's always another trade there or someone else their client or customer uh you definitely need to be a team player and be flexible because it's not always easy but at the end of the day you kind of have to figure it out and push through you definitely need to be an agreeable person because you have to be able to work with all the other trades we need to jump onto a job site you're going to have you know eight or nine different trades there and you're all trying to work to the same conclusion I chose this field because not only that did my family you know they were all in trades and stuff and I was exposed to it that way but I've just been a Hands-On person growing up and I've where uh where I'm interested in art and stuff like that and I do that outside of work I find that helps with uh when I'm piping and stuff you can make all the pipes look really good you know they're all symmetrical and everything's going going good together and I find you can look you can step back at it later look at it and everything just be proud of how it looks when I was a young kid I always used to want to figure out how things work so that kind of pushed me in that direction and it also helped me like I love doing mechanic work on the side for myself so wiring cars or remote starters whatever you need it also helps with that for sure I chose to be become an electrician because I really enjoy problem solving so again you know being able to open up that you know four square box or that 12 by 12 box and you've got you know 140 different wires and so it's kind of nice to be able to you know challenge yourself every day I think the most satisfaction of my job has to be conduit vending because it definitely is a skill and there's a lot of electricians who can't do it so definitely if you if you know how to build a pipe and you know bend a pipe and make it look real good like that's that's my sort of indicator that it's like okay this guy's a pretty good electrician if he can if he can run conduit and you know do it properly so you know do like six different bends in a 10 foot stick of pipe and it all looks you know decent it's like that's a good sign I used to work at a big plant and we had these big units on the roof and big units inside and we had to run like it was months and months and months of running cabling and termination and then when we finally turn it on and you can see everything working in unison and like all the units working bombs and everything was perfect and everything ran that was like a big moment like I worked for three to six months to get this job done and now finally I can step back and see everything work it was a very satisfying I find the most rewarding thing about my job is when the job's completed and you've seen like all the work that you've put into it and the effort and the thought and just the planning that all came together and it finally works at the end and it's really nice when your clients notice it and they notice the work ethic that happened and they say like oh look you know the lights look really good and they're really straight it's there's there's not picking anything apart because it all looks good already it's it feels really good we know when they when they notice it I would recommend somebody working in this field in New Brunswick because there's just so many opportunities it's constantly an evolving trade you know and things are always changing there's always more to learn there's always a job opportunities there's always you know buildings being built and things like that and work to do I enjoy where I'm able to be home and I can I can do all my side Hobbies like going Wheeling or going fishing or hunting and things like that and I could still be home at a decent time as an electrician and New Brunswick like you work on everything so it's like you're gonna work on you know conduit vending you're going to work on wire pulling you're going to work on running Tech cable all the different you know parts of being electrician you're going to get to do them in New Brunswick it sort of sets you up to you know either open your own business or you know move on to something else yeah New Brunswick is great because it's just nice to be able to you know live in the city but then also you know go out hunting or go you know four-wheel and stuff like that well there's never going to be enough electricians obviously because we all depend on power um but there's tons of work and you can almost pick and choose kind of what kind of job you want the opportunities are there to become a great electrician and to move the ladder faster than if you go into a bigger city that you would always be just a worker [Music]"

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"VideoID": "289",

"Title": "Best way to make more money in your electrical construction business.",

"URL": "https://www.youtube.com/watch?v=71sQGqmz8Ik",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] hey 360 electricians quick tip friday what is the one big thing it's not a small thing what's one big thing that you can do in your business right now to guarantee more money by being more efficient and more profitable stock your warehouse that's right i started out started in my garage and i stocked that garage with every single part that i could especially the parts i knew i used every day going to the wholesale house even for two or three parts kills time efficiency and productivity it's a bummer too when you go over there and they don't have the part then you gotta run to another shop to get a part so my big tip if you can if you can afford it either stock your van completely or stock your garage your warehouse with the parts that you need let me show you some of the things we stock here in our warehouse so we try to stock as much as we can here we have pvc in half inch three quarter one inch and then bigger and of course all the wire we could probably ever need in a in at least a two week period i've got a romex down there and our mc is actually behind the wall there all different sizes we carry uh usually uh stocked all the way to number six anything above that we probably special order we've got all of our plaster rings our mud rings our 4s boxes our industrial covers and they're all marked so 4s decora 4s double toggle etc etc coming down here next row over really quick all of our half inch connectors come down this aisle anything you need half inch is here so let's throw one out uh you need a half inch half inch what single hole strap emt boom half inch emt strap there you go two hole strap there you go oh wait you need it in three quarter just drop down this whole row right here is three quarter inch same exact part right underneath it you'll find three quarter one inch inch and a quarter and then above is all over the place over here we carry all of our lbs our condylettes again half inch three quarter one inch anything bigger we got quite a bit of stock as i said good enough for at least two three weeks of work got our bubble covers i've got our bell boxes all different sizes looks like we need to place an order for two of these our covers blank singles blank doubles moving over here all our devices switch plates etc etc our mc connectors our romex straps and all miscellaneous stuff over on this side a lot of the bigger stuff you'll find on the floor just because we have too much inventory right now we've got a couple of uh good deals good buyouts so we've decided to pick up as much as we can now you will notice that there are some post-it notes here these will be going over a video later on this is the truck stock so whenever we truck our stock truck our stocks whenever we stock our trucks we stock them to be the same so all the trucks will have eight half inch flex connectors four flex tmt connectors six flex couplings etc etc that's how we know what should be in stock in the vans and to keep them consistent and again those parts are only in emergencies they'll come in the morning and pull the parts that we need for the jobs in case they forgot a part or need extra this is what's in the van so i hope that quick tip helps do your best to stock your van your garage anything you can to try to avoid going to the wholesale house especially home depot anyway click the like button subscribe and we'll see on the next one"

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"VideoID": "290",

"Title": "apartment wiring || apartment electrical wiring #electricalengineering #electrical&amp;electronics",

"URL": "https://www.youtube.com/watch?v=tjTp8wqG0ic",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] thank you [Music] foreign foreign [Music] foreign foreign [Music]"

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"VideoID": "291",

"Title": "Electrical Working Drawing Basics for Beginners | Edu-Archs",

"URL": "https://www.youtube.com/watch?v=v3FD\_Z-8lR0",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] dear all welcome back to edwards today in this video we are going to see how to do an electrical working drawing let me show you an example of set of projects so the project which we are going to see is still plus two floors it's a duplex house so let me explain you the basic floor plans so in a ground floor uh we have car parking and a servant quarters a hall and a room with an attached toilet and at the first load the actual flat starts at the first floor so the first floor we have living kitchen and dining and in the front portion we have bed with an attached toilet and in the second floor we have family room on both sides we have two bedrooms so in terrace you have only the head rooms so now we are going to see how to do an electrical layout for this floor plan [Music] so for any electrical working drawing the first thing you need to see is you have to look for the electrical symbols assigned for this so each architect or a drafter will have his home template so here you can see the electrical symbols so the fan will be marked this way and the tube lights switch boards television points chandelier ceiling lights spotlights and 15 amps then 5 amps and you have 20 amps for ac wall mounted lights then the distribution board and commodore lights then the wall lights and below that you have an ah note a common node which will show you the the points where it has to be marked so the electrical points will be mentioned as like uh all light point should be fixed above lintel and all switch boats should be four feet six inches from the finished floor level and the tv points should be two feet six inches from the finished floor level as well the gazer point from the ceiling should be two feet zero inches and from its plumbing side it is one feet six inches these notes are in common this will be given in the working drawing itself so now we are looking at the still come ground floor plan so at the commodore you can very well see that the commodore lights are marked over the pillars and in the sit back you can see the motor room which has a 15 amps switch 15 amp socket mentioned there and in the car parking you will have to provide a fan point which has to be centered for in between the beams and on both sides you have to give one seating line for the car parkings as well in the wall you can provide tube lights also so the switchboards will be usually given in the wall side so the schedules are marked here and in the entrance or the main door you have a wall mounted light facing the outer wall and getting inside uh for the flats each main dose right you have a calling build points which will be marked and in the stack cases you can see the two-way switchboard and below the staircases flight you can see a electrical panel boats and you will have a eb ducts too along the uh main stack is wall and getting into the flat for the living room it is usually one fan points at the center and you have two wall mounted light so either it will be used for the decorative purpose or sometimes it will be used for having a night lamps and in the opposite sides also you can have one tube lights and as well nowadays the ac points are provided in the hall two so here you can see the 20 amps ac points usually the switchboards should be marked next to the entrance next to the door this will be convenient for the people to walk into the room by accessing the switchboards and for the bedrooms the same way while marking the fan points for the bedrooms you have to consider the loft dimensions you have to consider the loft locations after leaving these spaces for the loft you have to center your fan so that the air circulation will be throughout the room and the same way like our hall in the bedrooms also we have two wall mounted lines and one tube lights and ac points is also marked as well you have 15 amp socket for a study table or any other purposes and getting into the toilets you have a wall motored light and you have a gazette point [Music] and coming to the first floor the same way the toilets are marked with internal lights internal wall motor lights as well as points for the caser and in the bedroom it is typical one like you have two wall mounted lights and if the bedroom is larger then you need to provide two tube lights here the dimension of the this bedroom is almost 18 feet six inches so we have provided two blades on both the walls the same way the fan points also we have marked two fan points covering the entire room and about the balconies in the balcony based on your elevation purpose or for the decorative or for the aesthetics you can have a ceiling light or a wall motored light so the main living room will have two fan points with the central chantlear lights and you have switchboard access to and in the dining you have you have to provide sockets for the fridge and ac provisions also and if it is a service balcony you need to provide 250 amp socket for washing machine points and especially in a kitchen you need to provide additional sockets for micro oven or any other purposes a micro oven mixie or table top grinders so you need to provide extra points in the kitchens [Music] and in the terrace floor you need to provide an external wall mounted light covering your terrace area [Music] so these are all about the uh electrical working drawing uh this is for one small project let me show you an apartment project uh which has still plus four floors yeah so now we are going to see an electrical working drawing for this still plus four floors apartment so now uh we are looking at the still flow drawing whenever you're doing an floor electrical drawing first thing is you need to mark the beam layouts so that it will this beam layout will help you to mark your cube light points easily so wherever car parking is provided you need to provide a tube light points and in the sunken area you you have to be very careful and provide your tube lights [Music] not in the sunken area [Music] and now let me show you the other floor plans for your views [Music] as i mentioned earlier before reading an electrical working drawing first you have to look in for the legends whatever they have given [Music] and these are about the first floor so the flats the electrical load for the flats will be has to be classed this [Music] few more drawings for your views [Music] and in some cases the points are even connected to the switchboards also so you can very well see those markings in this drawing [Music] that's all for this video session thank you [Music] you"

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"VideoID": "292",

"Title": "Spring 2017 Electrical Construction &amp; Maintenance Projects",

"URL": "https://www.youtube.com/watch?v=2f1bzxzAvM0",

"Keyword": "Electrical construction techniques",

"Transcript": "hi I'm Lea hopper cam nuong next time and we built a hotshot basketball game for a final project we obviously we built the ramp we attached the basketball hoop there's a photo ID that will be counting all the points attached to this counter back here these legs up here will indicate stop ready and go for the first player each player has 30 seconds I'm at the end of the first player 30 seconds a fan will start and a buzzer will sound which will indicate a 10 second cooldown period during this period this led here will blink sign time when after the 9th blink is indicated the second players turn to go for another 30 seconds and then it sound a buzzer will sound at the end of the second players turn indicating that the game is over if you get more than 10 points on this counter a neon light will light up and indicate a set attempt and until they're hooked up to set up to 40 jumps [Music] [Music] [Music] all right hi I'm Ben this is Angela I'm will be presenting this project they what we have made is a threat detection and simulated elimination device sort of thing so what's going to happen is we have that transformer over there that current transformer achieving the MU is going to pass in front of the sensor and that's going to send me home that the only it is in front of sensor up to the PLC which is going to start a countdown which we have booked up to this this Tyler here will also activate the fire alarm which will make so much noise and amidst the spinny ball which you know so I kind of to the morning light and then after the countdown finishes they will activate conveyor belt which will then move the transformer to the last sensor down there which one that sensor is hit is going to start the motors and it's going to activate the M elimination device which is two poppers we have to notice is of course they're both running through a motor starter well the push the button on and then it's running through a VFD which is a variable frequency drive which just these controllers speed the motors because Gary's in smaller they say and then also once the air is not going that light would be fed and what is going about light orange so yeah I'm the turn everything on yeah [Music] No hi I'm Tom Tomlinson Jordan Branson for our project we are simulating the most gate that is currently being used at Venice Italy the most gate is used to protect the city from floods of doing due to high tide period it can protect from high tide up to nine point eight feet and it saved the city from major damage but here's a fan which is assimilating the storms the red light here indicates whether all the way up all the way down and then while moving you're in motion the buzzers yell and be blessed my name is Blake I'm Zach and our group project was you made a wire tucker and we used the three-phase motor and a BF p which is the variable variable frequency drive and what that does is it rolls through the motor down that way no rope whips and spin on pulley we use my own and led to indicate red or green whether the Thunder is on Iran would also display that on the low-low and he's a day would you use two switches this switches to turn the motor on and then the second switch is to do forward or reverse for pulling the wire through and then we did a plunder it will go off for one second to indicate that the system will start and then a fan just because and then we did a start/stop we are deer I'm a fish day for the role of duty another project thank you [Applause] I'm very quickly Jacob my dear politely we made an alarm system in the green light is on that means it's active if you open the door no change to yellow it can be an eight second delay with an alarm in a flashing light letting you know putting co2 rearm I activate seconds it will go to emergency mode with the Mersey mode we have flashing lights the colors on countdown to zero what's the hits zero is called out of it I have a red indicator to know your phone cops and we have a logo to tell you if the doors are closed ah yeah a central horn cause it was very very obnoxious and it hurts people's eardrums so we had disconnected earlier than that you liked the video click that like button if you dislike this is like like leave a comment down below look at all we did was try for more videos in the future thank you my name is John my name is Mike I'm anne-marie and we have anybody greenhouse yep so we took Vice guys for another greenhouse shrunk it down we used 120 volt transformer 24 volt transformer use block thermostat limit switch and control relay so the program if you this one is completely automated so right now what it's doing is this is the green light and that is showing you that it's okay to lock in there's no water running don't wait for it to kick on here okay there we go there we go and all the water is going the green light turned off which is saying that okay if your water is fun say you want to go inside you don't want to get wet when you open the door and actively hit the limit switch turns everything off and the green light goes on saying it's okay really a normal operating temperature for green also 70 degrees and so we put in a fan controlled by this thermostat here to cool it up when it reaches about 85 to 90 close to the laboratory you turn that on red light indicating that if it's gotten too hot the buzzer college to let us off as a fan of the running and turn it out it goes out and so I get this completely on vehicle it's going to shut off myself and then the real green light turns on no water running because go that is me I made a greenhouse all right so we use three PLC logos to do something that would should have been relatively simple to use the s7 foot we use the low notes because if you get out of school the world isn't an organized business we did some things we made a little more complicated we've got eight deep we've got everything wired 18 DC we've got fans buzzers light LEDs and all these different noises it's called an alarm clock to wake event making fun of our morning class because most of our labor class in Brooke yeah press the start button five-second delay shoots through the three stages green yellow get progressively worse and they can only be stopped we're the top you would have to get up there is no snooze on this thing okay so I'm Nate Wyatt Tyler and I we made a big bunk big bug hunting target shooter game so our motor here is on a 5 second timer and it's going to be moving back and forth our first start out push button is giving it power for a logo our second button is going to get power toward VFD our DMV control of our motor like the motor speeds on and also our logo I control the time beyond the border our motor is wired for a low voltage in a wide when I'm order isn't forward bias we're going to have our red neon LED light on our fan is going to be on and our brother is going to be going off and when the motor is in reverse bias we're going to have our green light on so what is just a demonstrate you can turn on though you're not oh that's our game all right this is the swag soda squad and this is Abraham I'm Daniel they're not so Kanab and we made a a soda dispenser that senses any types of soda that you want and it has run off of six volt DC air pump motors and it pushes air into the bottle and then comes out into into your tub using air pressure and we wired that stop and start switch button of the master control allowing total over power to the whole whole system and as soon as you press the start button three LED lights a buzzers will pulse five times simultaneously and and then our logo will read machine is ready and then there 80 dispensers over as sudden in the description since our master control as soon as you press that start button there three LED light and a buzzer will pulse simultaneously for five seconds letting me know the machine is ready as well as those firing out right away and students press the start button a neon light will indicate that she is ready and uh that'll stay on until the energized as well as fan you Nicole I use sensor so we used a 12 volt power supply here to power a pump and that's totally isolated from on our 120 power supplies that supplies our to our low metal gear which and signals to our inputs and output power fire wait for the windows power machine so after your power up is beyond my to stop with letting you know that's still right and say I want to know that is both the light and it's ready to pour up another project you"

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"VideoID": "296",

"Title": "Day in the Life - Construction Estimator",

"URL": "https://www.youtube.com/watch?v=7eSjzXR4xfI",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] I start my day off with a 50 minute long drive to work for some people that's just too long but personally I think it's a nice drive in the mornings and I'm used to it because I started working at this office right after I graduated from Texas A M just four months ago [Music] [Music] I arrive at the office around 7 45 in the morning and the first thing I like to do is check my emails and then I write out what I need to do for the day on my notepad so that way later I can cross it off the list afterwards I start working on the takeoffs that I have to do this is one of my main tasks as an estimator because I have to be able to double check the values that the subcontractors give to me in their proposals at nine o'clock I started following up with our subcontractors I was calling to ask them if they were planning on bidding our project and if they planned on giving us their number in on time all right guys it's currently 9 30. I already finished my coffee should have packed more that's my fault but now I'm gonna go see if my co-worker can say a couple words in front of this camera about something hey Ryan uh what do you think about estimating in estimators they're what make this world go round you know I kind of agree more with you thank you at 10 o'clock I got back on my computer and I started going through the plans to understand the project more and doing better takeoffs on it quick shout out to this awesome pin it matches my arguing but anyways I get to use it to mark off the list I made this morning of things that I accomplished okay it's 11 o'clock and I didn't catch this part on video but basically my boss just walked in the room asked him a couple of questions that are very uh but anyways he helped me out with understanding what to do in uh those situations so now I just gotta fix that and then I can get ready for lunch usually I bring my lunch to work but today Ryan and I wanted to go to BJ's [Music] okay so we're about to have an estimate review meeting in about 20 minutes and we're just going to go over all our tabs and make sure that all of our Scopes that we're in charge of is fully accounted for and that we didn't miss anything and that all of our prices are good so for that meeting I made sure both of these TVs works by connecting them with HDMI to my laptop and now you can just kind of go back and forth between them which is pretty sick [Music] [Applause] thank you [Music] as the last hour approaches I worked really hard on my tabs to make sure that everything we talked about in the meeting is covered and just how the executives like it all right here's a quick tip if you want to be really impressive in the construction industry make sure you have this master format memorized [Music] [Music] [Music] foreign [Music]"

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{

"VideoID": "297",

"Title": "Women set example in TSTC Electrical Construction Program",

"URL": "https://www.youtube.com/watch?v=k-nVydMQK0Q",

"Keyword": "Electrical construction techniques",

"Transcript": "three women followed their career path at the Texas State Technical College and set an example they never imagined heist Navarro joins us now in the studio with their stories laughs Dennis for the first time since 2010 three women have completed the TSTC electrical construction technology program they shared with me why it's so important for women not to shy away from careers that are typically male-dominated if I can do it than any other woman in the world can do it we showed ourselves up we showed them that we can be here we deserve to be here the electrical construction program at the Texas State Technical College has seen only men graduate for the last decade this year things were a little different I was so nervous that I was gonna be the only girl and I started out and crystal was in my first class and I was like thank goodness a bond was created between crystal amber and Keeley has they stepped foot into a male-dominated career hall with their own reasons and I wanted to challenge myself I'm good with my hands so I decided to go with electrical I always liked working with my hands I like doing manual labor it makes me feel like I accomplished something my father and my grandfather they're both master electricians so I grew up around it the last female to graduate from the program was their professor Letha novo sad who says it's been rewarding to see three women work as hard as they have together to know that she came right through this program so it was a true testament of how you show others that you can do it too according to the United States Bureau of Labor Statistics the number of electricians that will be needed in the u.s. is projected to be more than seven hundred and twenty-six thousand by 2026 so it looks like these women chose the perfect career I really hope that other women and little girls see other women doing this and they think I can do that too you know it's not just a man thing I don't know why that's a stereotype of it anyone can do it Krystal is officially done with the program but amber and Keely are going to expand their studies at TSTC for a little longer I'm Eliza Navarro back to you Dennis thanks Eliza"

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{

"VideoID": "298",

"Title": "Electric life hacks || 5 mint crafts || amazing tips &amp; tricks #electrical #shorts",

"URL": "https://www.youtube.com/watch?v=FNO6bzrQbWc",

"Keyword": "Electrical construction techniques",

"Transcript": "which one you prefer wait till the end you are watching a master at work"

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{

"VideoID": "301",

"Title": "how to make extension wire holder #electrical #shorts #tips",

"URL": "https://www.youtube.com/watch?v=f9GO\_fYUayU",

"Keyword": "Electrical construction techniques",

"Transcript": "uh [Music] [Applause] [Music] [Music] foreign"

},

{

"VideoID": "302",

"Title": "We don’t do that #foryou #fyp #comedy #construction #electrician #youtube #youtubeshorts #followme",

"URL": "https://www.youtube.com/watch?v=sXsCjhWsnJA",

"Keyword": "Electrical construction techniques",

"Transcript": "where in the hell did my helper do Mother of God hey the hell are you doing and where'd you get that stick with the weird little things on it the broom they're literally everywhere it's for sweeping up your mess did you say sweeping mess yeah I just figured I'd clean up the mess we made we don't do that and to be honest with you this is the last straw I don't think you're cut out to be an electrician I'm gonna get a talk to my boyfriend who's the superintendent and I'm getting you out of here"

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{

"VideoID": "303",

"Title": "OSHA Electrical General Requirements And Standards (What You Should Know)",

"URL": "https://www.youtube.com/watch?v=jh2MfsxAG2U",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign we will be discussing important OSHA safety guidelines and requirements that are essential for working safely with electricity first let's look at the electrical hazards electricity is a vital component in many workplaces but it can also be incredibly dangerous electrical hazards can cause serious injuries or even death it's important to know and understand the risks associated with working with electricity common hazards include electrical shock from direct or indirect contact with electrical energy electrical arcs and flashes that can cause Burns and explosions electrical fires caused by faulty or improperly installed equipment overloaded circuits explosions caused by electrical equipment and hazardous environments such as those with flammable gases or Vapors exposure to electromagnetic fields that can cause long-term health effects such as cancer or neurological disorders electric shock drowning which occurs when an electrical current passes through the water and causes paralysis or drowning it's important to take all electrical hazards seriously and follow appropriate safety protocols to protect your employees from harm now let's look at OSHA electrical General requirements here are some of the most important requirements that you need to know electrical equipment must be free from recognized hazards all electrical equipment must be approved by a nationally recognized testing Laboratory all electrical equipment must be used in accordance with its instructions all electrical equipment must be properly grounded only qualified workers should work on or near exposed energized parts a lockout tack out program must be implemented to protect workers from hazardous energy sources electrical work should be performed with the proper tools and equipment in addition to following OSHA electrical General requirements there are several best practices that can help to ensure electrical safety these include always assume that electrical equipment is live until you have verified that it is not where the proper personal protective equipment including rubber gloves hard hats and safety glasses keep electrical equipment clean and dry follow proper lockout tag out procedures use the right tools and equipment for the job inspect all electrical equipment regularly train workers on electrical safety procedures electrical hazards are a serious threat to worker safety but by following OSHA electrical General requirements and best practices you can minimize the risks associated with working with electricity by understanding OSHA's requirements for working in them and the hazards and precautions associated with them you can help keep your workplace safe and compliant one tool that can help you stay on top of your safety training is using our safety toolbox talk app this app allows you to easily deliver consistent and effective safety training to your employees so you can ensure that everyone is up to date on the latest safety protocols save valuable time by making it easy for your employees to consume safety talks from their own devices and acknowledge training at the click of a button as a safety manager you can use our toolbox talk library to create and schedule safety talks days weeks and months in advance all while saving time and boosting workplace safety your employees will have the flexibility to complete safety training anywhere and anytime enabling managers to focus on other tasks while still educating employees about critical safety protocols completely automated click the link below to request a demo"

},

{

"VideoID": "305",

"Title": "Fish Electrical Wire in Walls: The Secret to Easy Fishing! Running wires through existing walls.",

"URL": "https://www.youtube.com/watch?v=7xFsDCzb6Sg",

"Keyword": "Electrical construction techniques",

"Transcript": "we're going to imagine that this has drywall in it because i have to imagine that there's a ceiling and there's an attic as well so well where am i on the wall so well i drill a hole first in the ceiling itself drill bit like i say about three eighths or something like that small drill bit and i put it right to the edge right center of where the the plug or the switch is now how you can find that is let's say you're five foot yeah let's say you're five foot from the wall take from the wall go up to the ceiling mark your five foot line let's say okay so i'll take my drill and i will drill right through the ceiling not the wall the ceiling that way i get a little piece of romex okay and this is so i can it's my my guider so i could find where it is where the romex is or where it's going to go down where i need to drill from so what i do grab a piece of romex and i grab my cutters these are side cutters sharp right there i pinch just a little bit and pull and i pull and the sheathing comes right off okay i use the white wire so i can see it better look at that okay so my drill bit is just a little bit bigger than the wire itself i don't know if you can see that i'm able to run the wire straight up through the ceiling into the attic so i would take it and i would push it through the hole i just drilled up up up up up then that way let's say this is the ceiling you're crawling on top of it you could see this wire from across the attic so you put three or four feet if you wanted to so now you know exactly where your hole is going to be drilled okay so let's say this is my view from the attic i know that the stud you're going to be able to see the stud right on top of it it's a 2x4 so i know i'm not going to drill from the top a little high for me but i know that i'm going to be in yeah want to be like halfway from it from the outside from the ceiling so this thing was a guide if i come over here i know i'm not right over the box i know where i drilled was right where i drilled my hole for my wire is right above the box so i'll pull it out or what have you and just drill right there okay my next step is to get my chain small loop not too small it's got a little bit of weight to it this is a little big but it's just so i can show you what i'm talking about when i say chain i'm not sure the size of the loop but just something with a little bit of substance to it some people may say we'll get a thin chain string or whatever and put a uh put a bolt on the end well if there's a wire running across that bolt to get hung up so i just take it put my chain on try to put it on one side of the wire okay like so and tape my chain to the wire i'm trying to make it look simple but i'm trying to hold the wire back while trying to show you but there you go tape it right to it and tape a little bit extra on the end so it's going to taper through the wall it won't be hung up on the aeromex itself and me i was twisted at the end like so that's called a buddy tap that's your buddy on the other end when he tries to take it off he's got a little tab to untwist it and just kind of twist it on itself and it untwists easily for him so we're thinking about our buddy this time let me show you the next step now again we're pretending we're in the attic we're up top we see the hole we know where the hole is because we drilled it and simply push the chain or let the chain fall down i'd let it fall down a few few feet past the plug and how i know that is i usually but i didn't do it here if i put a piece of tape on the chain itself to mark okay i'm at three four feet or what have you okay and then now if we're looking inside the wall there's our chain dangling right above the box okay all right right inside here whoopsie sorry over and you push it it'll definitely pop out okay pop up semi easily now there's different kinds of boxes to use one of the biggest things is uh having um a steel box so you can secure the romex because as you see if we had drywall up we're not gonna be able to staple this now you could cut holes or what have you cut holes above the box above the walls you could grab and fish it but then the whole idea of this is fishing it so we don't have to cut those holes so okay here's our next step what we're going to do since we know where the box is and where we put our little guider hole make sure that the hole is right above it i just drilled the other hole just to show you but we know that that's right above where the box is because otherwise the chain will be too far out from the box you can still grab it but it's kind of a pain in the ass so i do is the take the put a little hook in the romex what i already used before maybe not out so much because i know that chain's gonna be dangling right there it could be past it the whole idea is just to get it into the box okay put it right up inside here and in the wall you know we can you can feel it or you just take it spin it around i don't know that i have that i like to feel the strength and then i then i simply bring it in now with a smaller chain you can get it but the whole idea is now i can see that chain in there now it is it goes smoother with a lot smaller chain but this just to show you now here's what i would do with this big of a chain okay with my chain sitting there and i can see it in the back of the box a pair of needle nose pliers grab it we know that the chains on there on the romex pull through all right well i'm holding this wire because sometimes when you tie that chain onto the romex the weight of the remix simply pulls it right into the box you know it could it could get let's say let's it gets held up on there well that's where that's why we tapered it with the tape and then we pull it in sometimes sometimes it's easier sometimes not but you know you play around with a little bit and then you just put a wire in it just like that nothing to it so now you fish that wire from the ceiling into the box successfully now we've successfully fished the wire from the ceiling or the attic rather i'm sorry into a plug or a switch what have you now we have the power there i told you just keep on watching because now we're gonna go from the box down into the basement or if you wanted from the basement you want to pull it up to the box it's the same thing but in reverse but i'm going to show you a little technique of drilling through because you can't see the the top of the stud from the basement because there's floorboards over it that you can't see but there's a technique that i use i still use a drill but i won't drill in through the floor because with carpet that drill bit catches a carpet it'll it'll pull that piece of yarn right i mean it'll a big long strip down your carpet not gonna like it hardwood floors you don't want to see it so what i do is i drill through the baseboard at an angle and uh that way it's just a little piece of white caulk and boom it's done and we do the same technique through the wood with that romex and then we can see where we are in the basement again we're using our imagination here i don't have white baseboard and this and that i'm going to show you how it would end up the trajectory would end up with drilling through the baseboard and how you would find out where your center of the uh stud basically so you could drill your hole up all right here we are from that plug okay or switch what have you and here's the bottom plate now there's wood let's just say there's wood underneath here i don't know where it is because that's what your 2x4 sits on take your drill bit about an inch up let's say into your baseboard and drill it at an angle like a 45 or so okay now just hypothetical we're looking down right there we know where we came out we know that we're into the uh just about the center of the bottom of the baseboard so what would you do then you would simply drill up yeah about i don't you simply drill up i don't know maybe about half an inch or so as that penetrated because you know you're not going to get into the center of the stud i'd go like half inch in and then i would drill my drill up just like we did in the uh attic portion simple as that now the same difference better chain this time i marked how far the chain was from the box to the floor let's say it's two feet you don't want too much pulling up otherwise you can't get it out of the uh you can't pull it through the hole but same thing [Music] you stuff the chain in through the hole strip it down until my tape stops it there it is there's my tape and i know that my wall or that my chain is right above where i need to be same technique as we did before that from the basement and we just twist it around twist it around okay and we uh pull it pull down pull it through you get the weight it pulled through on its own we've got the romex we have the romex still tied to it but it's as simple as that so"

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{

"VideoID": "306",

"Title": "The KickASS light #woodworking #electrical #lighting",

"URL": "https://www.youtube.com/watch?v=zOwPvchwwxg",

"Keyword": "Electrical construction techniques",

"Transcript": "one reason why I love my job so much is I got clients they'll come up and they'll be like hey man I've got an idea can you make me something he shows me a picture I'm like hell yeah we can make it I ain't never made it but but we're about to make it happen so a four foot circle out of birch plywood is our base for the project and you're like but Keith what are you making man come on tell me well I'm gonna tell you well we're basically building a giant pendant base for three large basket lights yes sir it uh it's gonna it's gonna be nice you got you got to keep watching man here we have the mounting bracket that will be bolted to the ceiling I found my ceiling joist layout and then I recessed for the lag bolt and the washer fragile it must be Italian it definitely makes you feel good when you build something you never have and the clients go Keith that looks better than the pitcher"

},

{

"VideoID": "307",

"Title": "Construction of contactor 220V #electrical",

"URL": "https://www.youtube.com/watch?v=REcuu5z\_Khk",

"Keyword": "Electrical construction techniques",

"Transcript": "220V contactor operation"

},

{

"VideoID": "310",

"Title": "Electrical House Wiring Materials Name &amp; Pictures | House Wiring List with Images | Electrician Work",

"URL": "https://www.youtube.com/watch?v=rt48hX2vCBo",

"Keyword": "Electrical construction techniques",

"Transcript": "one way switch two way switch bed switch calling Bell switch handan regulator board fuse KitKat fuse switchboard indicator two pin socket five pin socket two pin plug top three pin plug top switchboard extension board powerboard ConEd metal box pendant holder Bon holder angle button holder casing capping coupler elbow T external Bend internal Bend Junction Linker ceiling Rose junction box conduit pipe saddle clamp double nail saddle clamp conduit saddle conduit coupler conduit elbow conduit Bend conduit t 2way through box 2way angle box 38 T box fourway cross box flexible conduit pipe GI clamp screw screw anchor screwdriver line tester digital tester Mini hexo wire cutter insulation tape combination player heat shrink sleeve tube night Val LED Val rechargeable LED bub LED round panel light LED flat panel light florescent tube light tube light holder electronic chalk LED tube light remote control module main switch double pole MCV DP switch aring rod aring plate lightning arester K TI"

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{

"VideoID": "311",

"Title": "My CUSTOM printed BADASS extension cord #extensioncord #electrical #tools @badassproducts5199",

"URL": "https://www.youtube.com/watch?v=NUTIX6ud44U",

"Keyword": "Electrical construction techniques",

"Transcript": "check it out I ordered this badass extension cord last week and absolutely love it and I had to show y'all there's two reasons why you need this cord one is this prolog quick release cord end nothing is coming unplugged from this cord and two is right here look at that what that back up Terry yep that's right custom printing for free yeah I said free which is standard on all of their 50 Foot Pro lock cords I mean come on who wants to steal the cord with your company name printed all over it man"

},

{

"VideoID": "313",

"Title": "electrical tape to the rescue, #renovationtips #homeimprovement #abandonedbuilding",

"URL": "https://www.youtube.com/watch?v=txpsaDD6Utc",

"Keyword": "Electrical construction techniques",

"Transcript": "I'm installing the shower head in this whole home renovation and well she was giving me a little bit of trouble my channel locks her teeth are way too sharp and he started scratching the surface so I instantly stopped and now I'm wrapping it with electrical tape to help preserve the finish of the nickel and well I'll give it a whole bunch of wraps probably way more than I need and of course I have to use my utility knife to cut the end off because well I'm OCD about these things and yeah let's see how it goes a little bit more this little tape trick always gets the job done thanks for stopping by hi pixel"

},

{

"VideoID": "314",

"Title": "Electric Panel Tips #diy #electrical #shorts #homeimprovement",

"URL": "https://www.youtube.com/watch?v=B3-jcEWXCXk",

"Keyword": "Electrical construction techniques",

"Transcript": "Come coming down into the panel here. And what we're going to do\nis just going to use ways, existing room\nX connectors here that are already here. You can always put to wires into one room, X Connector. So let's go ahead\nand take our sheathing off of here. So biggest thing\nabout putting your hands in this panel is staying away from the back pluses here. So all of these side areas\nis the neutral and ground. That's not going to hurt you. The only part that's going to hurt\nyou is where the breakers were connected. So but you can always shut off\nthe main breaker if you're uncomfortable. And then connect things. So but you want to find an individual spot\nfor each of the ground and the neutral. So once you find a spot, just place them\nin there and tighten the screw and should tug on these wires. Keep it off in the off position."

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{

"VideoID": "315",

"Title": "Electrical Rough-In For New Construction | Building A $350,000 Custom House | Episode 21",

"URL": "https://www.youtube.com/watch?v=jxLAE1NxQJ8",

"Keyword": "Electrical construction techniques",

"Transcript": "how many times have you caught yourself using the restroom and your phone's about to die we're gonna have an outlet right here this was just an idea now look what's behind it a literal real home i want an outlet on this outlet over here [Music] they put two nails in the wall and it grabs this like metal rod that they have so this will be a 3-0 left hand okay 20 minute on here and that means it's fire rated correct [Music] what's going on everybody welcome back to nico's property show today i am super stoked and so happy to have you here at my custom home build why because we're getting the electrical rough-in knocked out i've been here all morning meeting with the maestro the head guy the hefe the boss and we're gonna head inside right now i'm gonna show you what's been going on what we gotta get into and show you like what it takes to get a house electrically roughed in there's a lot of things where you got to make a bunch of decisions you know do you want outlets here do you want one where you know sometimes you know when you're trying to reach and plug your charger in and it's behind the bed and it sucks guess what these are the decisions you make right now when the house is getting roughed in put them on the outsides of the bed instead that's just an example as we head inside i wanted you to understand what we were doing today so come on in follow me in great crew killing it right now mr cameraman do be careful we don't want you to trip up so we're in the house right now there's banging going on the running wires everything's happening and i've got a bunch a bunch of progress already from the beginning but i wanted to do a walk around with you first and show you what's going on so follow me kind of into the kitchen here and i'll show you an example oh i'm kicking stuff already i'll show you an example of what's actually happening so if you look here this will be easier way to show you if you look here this is kind of the symbol they draw to know an outlet goes here so he's got his lines right there everything's measured boom you put an outlet here we've got stuff right here where you're putting the switches and everything like that so he knows hey these switches are going to go to certain lights that are in this particular room and then if you come over here and just kind of show a little bit of what's happening you see more we're putting an outlet we're putting an outlet you see they got the line they measure real good boom and all the rooms have this entire you know concept of hey where are we putting outlets what are we going to do so i'll have you follow me actually into why don't we go into my master bedroom let's go let's do that so we're walking through like this hallway that leads to the pantry area and we'll sneak through some walls here so i'm here in my master and one thing for me is i love technology i love innovation and everything like that so i want outlets everywhere i want cam lights everywhere i want bright lights i mean i want it all so as you see right here i've got an outlet on this side and my bed is actually going to be just to give you an example just like this nice king bed right there so i've got outlets on this side of the bed i've got outlets on this side of the bed and so they've got the little things drawn and my window was a little bit low so we kind of ran into a situation where my outlet's actually gonna have to be sticking out of my baseboard a little bit because i did set my windows too low but that's just a part of construction and the next time i build a house i'll be raising these windows up a little bit because you've got space above the window however got that all figured out if you come in my bathroom this is gonna be really cool actually so how many times have you caught yourself using the restroom and your phone's about to die and you can't charge your phone guess what we're gonna have an outlet right here so if you're in the restroom and you need to get a charger we're going to charge the phone in the bathroom kind of nasty but still and guess what another outlet for when you're in the bathtub not safe electronics water but guess what sometimes your phone's dying gotcha it outlook don't worry gonna have super bright lights everywhere let's head back in the kitchen area while they're banging around a little bit and i'm gonna squeeze through this wall how about that but what i want to do is explain a little bit about what's going on in here how bright it's going to be i'm a big fan of can lights it really brings the house together led cam lights and there's this new thing going around where they're kind of flat and it's like one piece and you can't just change a light bulb anymore you have to change out the whole thing but it just clips in so it's pretty easy we're gonna have i think we counted four eight twelve i think i'm gonna have about 16 can lights in here i'm gonna have these like pendulum lights hanging over this beautiful little island area i'm gonna have a chandelier over this dining table right here and then the bedrooms speak for themselves but i want to get some of this progress and some of the process so y'all see how it works i'm gonna jump into what me and the maestro were talking about earlier the boss man and we're gonna just show you you know how this thing works how you set it out how you decide where you want stuff and we're just gonna get this worked on so let's get straight to the video and let's roll that music [Music] here's your marker i think i'm gonna go [Music] okay so you got two switches here yeah two switches i want an outlet on this outlet over here because the bed is going this way so i'm gonna have a king bed right here so we'll go outlet outside outlet outside and let's put outlet on this side too but only the only problem i have here is i got my trim board and then i got the window trim um is it let me see let me google how big a king bed is that way maybe i can put it on the inside of that if possible width of king bed this is what you got to do problem solved 76 inches can i see your ruler sir let's see oh man that's right there brother in the window um all right so so it's going to be sticking where's the outlet going to end up like flush with the wall yeah with the with the base with the baseboard i see what you're saying okay uh did it look good yeah what's is there any other solution or that's probably the only solution yeah it's too low yeah all right that's fine let's do it well sometimes you don't want to do it but you got to do it so we'll be fine [Music] [Applause] [Music] [Applause] [Music] [Applause] so i'm gonna be right here hmm or do i want the door to go in here so these are some of the problems you got to go through are not problems big challenges like it's not a big one but it's still a challenge because you're thinking do i want to open the door this way lose space inside or open the door this way but then it's like no one can walk through if i go in the pantry so there's just things that when you're trying to figure out your sockets and or your outlets and your switches and everything that you really got to go through maestro i was thinking open the door this way because if i open the door in i'm going to lose this so if i go here do i put the switch on the outside or do i put the switch on the inside what'd you think i'm up for advice that way it's hidden but it'll have to be because open and then yeah the switch is inside but i said to you if you want to put some shelves all the way across that's what i'm gonna do so we can put it outside if you want yeah okay so yeah do one here problem solved we're good [Music] [Applause] [Music] or can you do all four like can you do two for here two for there the left two are this way the right two are gonna be that way door's coming this way yeah so probably here and switch for one can one exhaust and uh outlet gonna be somewhere here yeah that's how you do it you gotta actually go through the motions like if i'm sitting there and i need my charger where's the actual outlet gonna be at and then shower um i need an outlet in there in case i gotta charge my phone nice light my designer drew this pretty good though and then some cushions and stuff but i want some outlets here too somewhere i don't know where but i want some [Music] do [Music] all right y'all so just want to give you an idea what's happening here my man adrian is pulling this wire through all kinds of holes that they've already drilled and as you can see literally he's pulling it you're like maybe where is he pulling it from i don't understand if you flip the camera this way they get these little makeshift situations where they put two nails in the wall and it grabs this like metal rod that they have and this just keeps on rolling so they go through probably would be boxes they got to this two three four boxes and they'll get this house wrapped up i think it's a two day job are they on two day job three day job this is a three day job you'll get it wrapped up every after everything is done it's going to be super easy and it's going to look beautiful because the next thing that's going to happen is we're going to be able to progress we're going to be able to get insulation done and things like that and then we're going to be living in this house before you know it i'm excited for that so they're going to keep running these wires keep getting more progress and i just want to show you how some of this process works so let's get back to work alrighty uh walking down my makeshift ladder actually added some little steps in there so it's a lot easier to come down but my guys man absolute electric they are absolutely killing it however oh that makes sense absolute electric absolutely killing it but anyways i wanted to go over some of these plans with y'all okay so these are probably kind of a little bit bright but right now there have been changes made okay so there was the plans that you know had everything in each certain spot but at the end of the day the house is going to be yours you can make small little changes in between you don't want to make you know crazy changes because that's what you bought the plants for i loved what they were i loved the layout and everything like that but once my house we had that situation with the blocks being laid on the wrong side and it got about eight inches smaller had to tweak a few things and what i really love about this process with you know the electrical rough in is that this is when i'm dressing up the entire home i love lights i love you know i love like bluetooth and just i don't know the innovation electronics i love that stuff so when we walked into my office i was like well i want four can lights i want a fan i want outlets everywhere i'll probably have tvs in here i'm gonna do it big like i love innovation so seeing these plans actually come to life i mean this is a piece of paper this is a house but mr cameraman let's back out a little bit let's truly show them what's happening this was just an idea okay this was just an idea now look what's behind it this a literal real home that i'll be living in one day here shortly i'm absolutely in love with this process i'm loving how it's going and i love when you're dealing with subcontractors that just make you you know feel excited to be there when when they're getting the job done when they're actually doing a great job and you're like yes i don't have to babysit them too much and they're gonna do a great job if you pay them right always pay your subcontractors right if it's fair for you and it's fair for them the job will get done just right i'm a firm believer in that so anyways big shout out to my guys here we're gonna get back to work i'm gonna get more progress of this and we're just gonna keep getting this thing built because i gotta live here soon so why don't i get out of the way and film some more footage so we got the galvanized rod so you're putting the meter here it's gonna be in here okay and so we can just put the panel on the inside of that here let's go take a look yeah it's not gonna be it's not gonna be too bad seeing that from the road no i mean well we can do this what can we do we can we can go on the ground also cool we have to see wires hanging yeah we want to go underground see that's it see that's absolute electric it's absolute come on man okay somewhere here okay yeah so i got a water heater here how much space you need just five feet away okay so i'll probably be here where you at be right there okay yeah that's good because my my finished poured uh concrete is going to be i think here so just make sure yeah okay and then how tall is it gonna be five feet five feet up okay like uh from the bottom okay from the yeah yeah okay okay cool yeah yeah all right that sounds good then all right man that's how you promise myself get it done ain't even a problem it's that easy one two three and it's done because of this guy see you you're a professional that's why i called you licensed professional that's why you call them top of the morning to you folks we are here at my property and it feels so good to finally be on day two of the electrical rough-in so we've got a lot of progress they're killing all the work everything is going down and i'm excited to bring you in because yesterday when we walked in there was almost no wiring literally they were just kind of banging on stuff putting some of the outlets in but today this entire house is almost filled with all the wiring they got another day of work and i think they'll actually be finished by the time this video ends so why don't we move inside this house real quick and i'm going to show you how different it looks and what it looks like for electrical wiring to be in the house so you'll hear a little bit of talking in the background a little bit banging but bear with me i'm doing my best here so just as we walk in right away you'll see here's the outlet boxes like i showed you yesterday and here's what the wiring looks like when it's ran all through the house so as you go through the bedrooms as you can see through some of these walls you can tell like there's wiring all across everywhere because there has to be a connection from every outlet box to the next outlet box to the next outlet box and then that wiring has to get all the way back to electrical panel which are called home runs so you'll see a lot of things where they're ran like it's run from its home so it's a home run but anyways why don't we move into some of this area right here so i can show you what the concept of everything is so right here this thing hanging i wanted to show you this because i'm like man this actually intrigues me so this is the bathroom vent right here and as you can see they got it installed the electricians did it and then the hvac guys have to come and connect this into that so that when you're using the restroom and you actually turn it on that air is ran all the way outside of your house so you can see there's piping everywhere we've got these switches in place they've got switches all over the house and again it's just so cool to see how the guts of the home actually come to life because most of the time you you walk into a house you tell a realtor you want to buy it and all of a sudden you own a home but in here you're watching the progress of putting the home together it's like playing tetris it's like you're putting legos lego pieces together and now you have a home so we're going to go into this side of the house where they're doing a little bit of work and we do have the electrical panel getting installed today so that's going to be something really really cool but as you go in here the kitchen is also wired already not everything so we're missing a few of the wires and everything like that so they still got a ways to go like i said they still got a days full of work um and so you see wiring going all the way around the master bathroom all those things are good and all those places i told you i'll wear i was adding outlets like by the toilet by the bathtub those are going to be really clutch places because that's like the worst when your phone's about to die and you can't use it wherever you're at in the house so we're going to go this way we're going to try to stay out of their way i'm going to sneak through here i'm going right here excuse me sir so we're gonna go in here and show y'all how they're actually setting up this electrical panel mr cameraman be careful on the way down we don't want you tumbling forward yes please be careful oh see that look i'm telling you we almost had a man down y'all but that's real life so they're getting this electrical panel right here she's opening it up um the brand is just i guess is that pronounced siemens i think that's what it's pronounced is that what i was pronounced siemens it's siemens elect uh electrical panel and actually opens it we'll do an unboxing video so why don't she become the star here check this out boom so most houses have an electrical panel like this and it's pretty simple i guess if you've seen them enough times but if you've never seen it this is what it looks like and they're going to install it it's going to be awesome i'm excited to get this progress but i'm going to stop talking here we're going to get them working and we're just going to get this thing progressing even more [Music] do [Music] [Applause] [Music] all right joe so that was pretty simple they got the electrical panel installed and my concrete level is actually going to be about right here so when i'm actually standing here this is going to be at a good level for me to be able to go in if something you know if the circuits breaker going off or something like that you got to fix something or reset the breaker it's going to be at a good level so they got that installed and the next thing you'll see is them running wires all the way from around the house from all the outlets everything like that all the way back to this panel so it's gonna be pretty pretty cool process to be honest i was gonna say simple but it's actually pretty cool not simple um and we're gonna get you all a bunch of the different areas of where they ran the wiring and everything because it is pretty cool how they've done stuff that way you can get a vision of you know where i'll have tvs where i'll have different type of things switches and through all the bathrooms and all the bedrooms so why don't i get out of here stop talking and he's going to get you some dope footage [Music] [Applause] [Music] do [Music] [Applause] [Music] [Applause] [Music] all right y'all so my salesman from 84 lumber is actually about to show up so in the middle of all this electrical going on we're going to get in here we're going to get our doors measured up we got to order these things okay with the supply chain with how things are going 84 has been doing an awesome job mr don first of all appreciate you sir everything they do for me here at 84. always good to see you hey it's a pleasure so we're just going to do what we're doing anyway you guys are going to follow along and we're going to get some doors measured so don't mind us all right so here we're going to do a case opening okay which means it simply means you're going to have trim on both sides okay so we've got a 308 okay okay so come over here so you can see kind of how he actually does this so just so we remember ain't no reason to keep it in our brains he writes it right there 308-0 case opening oh that's good stuff coming right here we got a 2 8 which a 2 8 simply means it's 2 feet 8 inches okay 32 inches okay all right which our rough opening is 34 inches okay um so that the door will fit in right hand signifies a right hand end swing right arrow i always put on the hinge side which is just something that i do why not help us out why not help us out okay in here this will be a closet okay we got a 4-0 by hand which means both doors will open up i gotcha of course it comes pre-hung and right trim on it like that so so it's pretty easy to install everything is just pretty quick that's what we like to hear that's what we like to hear how long you've been in the business sir um about 18 years uh we've got a two six right hand door here and one thing that uh as i walk through the house especially if the electrical's already done um it makes it easy because the wall stretches are already here and i know that the door is going to swing opposite there you go and i'm learning all this stuff it's my first build y'all so i'm learning from mr don here i know my family's been in it but you don't know this stuff until you're actually doing it all right here's one that's a little bit different this is a just a little closet um it's gonna be a one one full right hand because it's swinging out okay um into the hallway space because we got our light switches i got you i don't get the question see look at that all right so here we go two eight door it's gonna be a left hand and the reason is obviously we have the light switch here but we have a wall space you always want to swing that door towards your wall so we'll be going here boom that's okay good access that's what we're looking here we have a closet uh it could be a 2 8 left hand because we have our wall switch there you go i got you that's pretty much now how long did it take you to get this quick [Music] um you know you just learn it pick it up typically we don't have the builder with us oh i got you i got you um but again even if the electrical's in or on in i can go through and mark stuff right i see how the walls are and so once we get these measurements then we'll get into the design and then you you you get that release you just need to know the door style the casing and the hinge boom and then you release that and we get them ordered yep see as simple as that y'all so you get them in and big shout out to 84 lumber again for all this kind of stuff that they got going on all the materials if you didn't know they don't just sell lumber you can pretty much get anything you need um and all you got to do is look up their website but we're going to get through the house get some more door sizes and then i'll get with him on design and everything like that so enjoy the rest of this awesome montage about all this work going on we're going to get back to work let me stop talking [Music] bow [Music] nikolai everything that we've done through your house so far has been two by four walls right and this is something that can simply be missed okay this is the two by six one right so it takes a deeper jam depth i got you for the door so and that was my fault i told them run two by six all the way down well that's okay and i was like just cost a little bit yeah for a six and nine sixteenths okay so but not a problem it's just it's an easy miss okay one when i'm putting a list i got you okay so this is why you get a mr dawn to come out and get it figured out for you 306 8 right hand opening end write it on there that way i remember right i got you okay a lot of progress that's what we like to do we're almost done we've got what one two three doors left and yeah we got three doors left oh and the back door for the covered porch so four doors left and we're good to go all right here's here's another one this is a bathroom yeah and a lot of times most of the times these doors swing towards the bathtub okay you have a freestanding unit yeah um you know the only other option really is to you don't want to swing it towards the vanity right the only other option is swinging into the bedroom it's nice right so tell me this if i swing towards the bathtub what could i put there to separate so that we don't accidentally keep banging the bathtub is there something i could put in my i could do a hinge stop on the door okay because if you put something on the floor down here and you're able to stub your teeth that's very true and then you're going to say bad words right we don't do that so we know this is gonna be a two-six it's gonna be a right hand and we just put a hinge on it and it'll stop it at a 90 or how's that okay i mean you can stop it oh even a little bit closer see that's what we like to see you adjust the hinge okay and i need to but i need to order that or is that like something that's inside that's something that you would uh get with when they do all your door hardware your locks i got you the hardware folks yeah okay and they they figure the whether you're gonna do baseboard stops or stuff i got you so that's this one would definitely be a hint i got you something see problem solved so obviously this is the the throne room where yeah it's going to be a water closet right um 2 6 left hand because we don't have room to swing and i got some good outlets here i got an outlet for the bathtub i got an outlet for the toilet room you know it's funny when i first started doing this many years ago people used to put phone outlets in their back in their toilet that's crazy um but now with cell phones yeah you know how he does that which makes perfect sense because when you disappear in the toilet room that's like yeah don't talk to me i'm on the phone or something like leave me out of your business but that makes so much sense i want to run across a house that has that that'd be pretty cool to see anyways oh man nikolai this is the entry door from the garage correct by code this wall it's 20 minutes for the safety of the home okay so this door has to be 20 minutes i got it this will be a solid core door same style as your interior doors okay but they'll have spring hinges on it which is part of the code here is that new it's it's not new it's been probably five six seven i got you i've been seeing that where now it it closes by itself and i had never experienced that but i ain't built in a long time so this would be a 3-0 left hand okay and i always write 20 minute on here so i know and that means it's fire rated correct is that well 20 minute means it gives you 20 minutes of fire rating oh wow because on your garage you got to have five eighths right i gotcha which gives you that that gives you that i got you well it gives you time to get out so that's cool all right so we're pretty much done with all the doors yeah the thing is adding up your attic stairs okay um make sure that's part of our rest okay matter of fact sometimes i do this right here if it's in this area i got you to remind me there you go that's good because we got too much going on in life but hey we're gonna we're gonna wrap this up get these doors knocked out and then we're gonna continue with the electrical work because this rough end is going very smooth right now so i'm gonna finish up with mr dawn here again big shout out to 84 lumber thank you for everything materials getting here on time and it's coming and it looks good too sometimes you get material that you don't really like and i like 84's material so we do appreciate that but we're gonna get back to work get everything done so appreciate y'all watching to this point [Music] [Music] [Music] [Music] so [Music] now [Music] so alrighty folks we are finishing up with the electrical roughing i'm so happy with the progress of this build everybody that's been coming in and out getting that electrical rough in done and then getting mr don from 84 lumber in here as well to get all my doors measured it perfectly fit up because as they were doing the electrical rough and like he said he can see where the switches are so now he's not guessing like hey are you opening the door this way are you opening it that way the switches are there you know exactly which way the door is going to open but however i'm extremely excited with what we got going on because now that is getting done i'm waiting on these windows to come in so then i can start moving into my installation and everything like that we did have a situation where the windows were on back order which is okay because the supply chain all around the world right now is dealing with that so if you are out there and you're about to build make sure you order your windows at least 16 weeks in advance because it is one of the toughest things to get right now with the glass and everything else that's going into building a window however if you did enjoy this video make sure you like and subscribe and make sure you follow me on all social platforms especially tick tock because it's so easy to edit and post there and if you haven't yet make sure you check out niko'spropertyshow.com grab you some merch maybe a hat maybe a t-shirt a crew neck or whatever it is show some support and i'll greatly appreciate it i hope you have the best day ever smile more worry less and stay blessed peace out [Applause] [Music]"

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"VideoID": "316",

"Title": "Electricity Safety Precautions [ Electrical Safety Tips] | UltraTech Cement",

"URL": "https://www.youtube.com/watch?v=GTnRJNqoPJM",

"Keyword": "Electrical construction techniques",

"Transcript": "if you are not careful when you're doing electrical wiring it could end up being life-threatening our tips will help you stay alert and save always seek advice from a registered electrical contractor for all your electrical work during the planning stage don't forget to plan for electrical connections faults it is also important that you confirm with your engineer if fur thing has been done properly before purchasing electrical materials check for isi tags on each product at one electrical point check carefully that there aren't too many joints of connections it is advisable that you use fuse for all your electrical appliances ensure that your electrical connections are kept away from water and extreme heat check very carefully for unattended live wires if left unattended live wires can be very dangerous these are our tips for things to keep in mind when doing electrical work keep watching Bob Perkey from ultra tape [Music]"

},

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"VideoID": "317",

"Title": "Cut Perfect Electrical Outlet Holes Without Measuring!",

"URL": "https://www.youtube.com/watch?v=DSMq61CoTa8",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] welcome back to three bricks higher guys my name is dom and today i'm going to pass along a tip to you that's just too good not to now when someone's hanging sheetrock they know the proximity of this box behind that drywall they use something similar to a dremel tool and they router out the hole to access this box and that works great in that application but what happens if you're using paneling or thick siding now for the interior walls in my shop i'm using half inch siding now i've got to be able to access each outlet box from behind half inch siding now i can do all the measuring or i can use this tip and save myself a heck of a lot of time that thin sheet of cork board i pulled from a do-it-yourself gasket kit from an auto parts store now those screws right there they fit in the top and bottom of that box and these are earth magnets you can get those online you see those channels right there directly underneath the screw holes that's how we're going to mark this guys this is extremely simple to make and it is very effective all right those earth magnets are very strong and they will not slide on that cork after you got a piece together like that just screw that in and guys that's it this is the final product and this is the tool that's going to save you a lot of time this is another earth magnet and as you can see the screw will go right through the middle of it and screw into the center of this outlet you can find all of these earth magnets online they're relatively cheap you can see that is dead center it's not going anywhere i'm pretty sure you can see where this is going so i'm going to finagle this sheet into place that's all there is to it i know the box behind the sheet is straight up and down i'm going to make sure this one's straight up and down as well i already know it's centered up i'm gonna mark it then i'm gonna drill a couple of corner holes i'll cut that rectangle out with my jigsaw [Music] we're gonna slide this sheet back into place and guys i love it when a plane comes together that is dead center and it is perfect now i have this outlet recessed because it's some part of the shop where i've busted a few outlet face covers and i think i want to prevent that and i will have other outlets around the shop that will be flush with the wall you can always measure but that's going to take a lot more time guys invest 15 minutes this will save you that time my name is dom this is three bricks higher post videos online about every two to three weeks check back and subscribe that's up you will catch you next time [Music] i think i want a door right there [Music] ain't got to work"

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{

"VideoID": "320",

"Title": "electrical work techniques",

"URL": "https://www.youtube.com/watch?v=0tAgesTV6-Y",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] to"

},

{

"VideoID": "326",

"Title": "demolition work @ungalpaul #shorts #plumbing #electrical",

"URL": "https://www.youtube.com/watch?v=7BD3S87mCgg",

"Keyword": "Electrical construction techniques",

"Transcript": "everybody down for me [Music]"

},

{

"VideoID": "330",

"Title": "BEST STUD FINDER PERIOD !!! #tech #techhelp #shortsvideo #tipsandtricks #electrical #construction",

"URL": "https://www.youtube.com/watch?v=\_P3EcqLMkEk",

"Keyword": "Electrical construction techniques",

"Transcript": "here's a quick tip on the best stud finder it's not an electronic one they've never been reliable for me I always go to the hardware store and I just buy a high powered magnet it's really cheap they're usually like five bucks you run them across the wall and what it does is it finds the screw that's holding the drywall to the wall every single time for more quick tips please like And subscribe"

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{

"VideoID": "331",

"Title": "26110 Basic Electrical Construction Drawings Video Lecture Part II",

"URL": "https://www.youtube.com/watch?v=pCRWWvQgKvU",

"Keyword": "Electrical construction techniques",

"Transcript": "hello i'm brian young and this is 26 110 basic electrical construction drawings part two if you haven't already viewed part one go back and watch part 1 of 26 110. let's take a look in our book the nnccer book level 1 module 10. this is types of construction drawings and as always we have some trade terms architectural drawings working drawings consisting of site plans floor plans elevations sectional views details and other information necessary for the construction of a building they call them blueprints even though they're not blue anymore an exact copy or a reproduction of an original drawing so it's a blueprint detailed drawings are an enlarged detailed view taken from an area of a drawing and shown in a separate view dimensions are the sizes or measurements printed on a drawing and the electrical drawings are a means of conveying a large amount of exact detailed information in an abbreviated language consists of lines symbols dimensions and notifications to accurately convey engineers designs and electric uh to electricians who install the electrical system on a job uh elevation floor plan plan view you can look those up read your trade terms here on page one on the left hand side site plan a site plan indicates the location of all utility lines so a site plan is a very exp expanded view of the entire lot it'll show you the streets it'll show you the building how it sits on the lot it'll show you where the utility comes into the building including the water uh indicates the location of a building on the property this type of plan of the building site looks as if the site is viewed from an airplane and shows the property boundaries the existing contour lines the new contour lines after the grading the location of the building on the property new and existing roadways and all utility lines and other pertinent details so that's a site plan and that's when you'd use the engineer's scale of one inch equals 50 feet here's a site plan you can see that it shows the street it shows the entire building how it sits on the lot you even have uh lines showing you the grade in other words uh the slope of the land that this building is sitting on and then they're gonna go to the next page they're gonna show you the details of this section of the the plan so that's why it's shaded uh i'm sure my eyes aren't good enough but i'm sure that it tells us where the utility is coming in somewhere on here um it'll show you where it comes into the drawing and here again here's that cutaway view this is how we get a floor plan imagine taking the roof off and looking straight down on the building and there's your floor plan uh here on page five talking about sectional views elevation drawings let me read this on elevation an elevation drawing shows all exterior faces of the building the elevation is an outline of an object that shows heights and may show the length or width of a particular side but not depth a sectional view a section or sectional view is a cutaway view that shows the inside of a structure so when you want to know how this building's actually built and what uh types of electrical raceways you're going to need you can look at a sectional view and it'll show you what kind of raceways you need wall sections show how each wall is constructed and usually indicate the material to be used this information is important when determining wiring methods so you'd look at a wall section when you're trying to determine your wiring method to use in that building and here's a couple more elevation drawings this is sectional drawings figure six so this is showing a sectional here they cut one into the building off and they're looking at the building here's section a it shows how this is made uh has a concrete blocks and it has drywall on the inside it has uh rafters two by four with shingles it shows you how it's made or how it's going to be made here on page eight on the right hand column in general the title block of an electrical drawing should contain the following information address of the project show the name of the project the address of the project name of the owner or client the name of the architectural firm the date of completion the scales so it tells you uh an eighth inch equals one foot or a quarter inch equals one foot the initials of the draft of the checker the designer and the dates under each job number sheet number and if there's any revisions tell you that in the revision block over on page 10 on the right hand column revision block in other cases a revision block is provided again near the title block as shown in figure 13 the area on the drawing where the revision has been made will often be circled with a cloud shape so uh if there if there was a revision to the drawing something changed i'm going to make this very simplistic here is the front door and they decided they wanted to put on a porch there was no porch before they'll come in here and they'll draw the porch with steps and this whole revision will be surrounded by a cloud they'll put that around it and on the revision title block they'll say uh new porch and then they'll give you the drawing architectural a5 whatever drawing it's on you'll go there and you'll see this cloud and it'll tell you oh this is this is the revision they added that porch it wasn't there uh before and now it is okay uh here on page 13 it's showing the different types of lines a light medium and heavy full line an extra heavy full line a center line tells you the center of a column or the center of an object sometimes they'll say aff above finished floor so it might tell you that switches are 48 inches af above finished floor here other wires exposed wiring might have an e in it wiring concealed in the ceilings or walls is solid if it's concealed in the floor it's a dotted line uh wiring turned up is hollow wiring turned down is solid uh architect scale here i'm on page uh 17 18 19. here are architects scales uh on the right hand column of page 19 says triangular architect scales have 12 different scales two on each edge as follows and i i enumerated some of these so you have uh three thirty seconds equals a foot a quarter inch equals a foot a half inch equals a foot three inch equals a foot uh notice you don't have something like uh inch and three quarters they have inch and a half but not inch and three quarters because they want it to be a division of another drawing so three inch equals a foot inch and a half it goes a foot they don't have any inch and three quarter equals a foot uh they do talk about metric i'm not going to get into metric we don't really use metric that much uh here on page 23 talking about the electrical drawings power riser diagram a single line block diagram used to indicate the electrical service equipment service conductors and feeders and sub-panels notes are used on power riser diagrams to identify the equipment indicate the size of the conduit show the number size and type of conductors and list material related materials so that's on a power riser diagram what they sometimes call a lie one line diagram okay power riser diagram can also be called a one line diagram here on the right hand side of page 23 they're talking about shop drawings uh says this means that a complete set of electrical drawings could consist only of an eight and a half by eleven inch sheet or it could consist of several dozen 24 by 36 inch sheets depending on the size and complexity of a given project a shop drawing for example may contain details of only one piece of equipment while a set of working drawings for an industrial establishment installation may contain dozens of drawing sheets detailing the electrical system for lighting and power along with equipment motor controls and wiring diagrams it says a schematic diagram and an equipment schedule may contain a host of other pertinent data so part of the shop drawings are equipment or panel schedules all those schedules door schedule windows schedules for electrical it's a panel schedule equipment schedule or panel schedule is part of the shop drawings for the electrical portion of those drawings here on page 24 on the right hand column down close to the bottom of the page it says circuit and feeder wiring symbols are getting closer being standardized most circuits uh concealed in the ceilings or walls are indicated by a solid line a broken line is used for circuits concealed in the floor or the ceiling below so if it's a dotted or broken line it's concealed in the floor this is a symbol for a duplex receptacle this is a single receptacle and a duplex receptacle 120 volts and of course the range was three lines with an r range or if it's a d it's a dryer wiring concealed in the floor is a dotted line or dashed line i should say dashed line is a wiring concealed floor the number of arrow indicates the number of circuits in the run so if there's two arrowheads there's two circuits in that conduit if there are three arrowheads there are three circuits and so on here on page 29. on the left hand side looking at the symbols wiring turned down is a solid circle wiring turned up is a hollow circle number of arrowheads are the number of home runs um again i'm not going to go through all of these different symbols there are a lot of them look at them try to compare them with your drawings and see uh if you have any questions again here they're going to shade the part of the drawing that's actually pertinent to that drawing so they'll show you this is part b this is the part of the building that this drawing pertains to not part a if we look on page 41 there's a commercial drawing and if we look at this very very very tiny writing up here it's oh man i can't even make it out not even wearing my glasses hold on a second but it says underground underground electric service see power riser diagram sheet e4 so that's telling you where the incoming line is coming from from the service underground electric service that's where the power comes into the building see power riser diagram e4 okay so over here on page 44 the right hand column they're talking about uh the code book the national electrical code book nac section 21052 a states the minimum requirements for the location of receptacles and dwelling units that's somewhere where someone lives specifies that in each kitchen family room dining room receptacle outlets shall be installed so that no point along the floor line in any wall space is more than six feet measure horizontally from an outlet in that space we call that the 12 foot rule this means that the outlets will be no more than 12 feet apart because you can get six feet from one receptacle and be within six feet of the next receptacle and you've never been further than six feet away from a receptacle so the code book says no point along the floor line measured uh horizontally greater than six feet from a receptacle we call it the 12 foot rule on page 46 very bottom of the drawing this is again a residential drawing they're showing in the kitchen these counter top receptacles you have to have a minimum of two uh small appliance branch circuits in the kitchen those receptacles located above countertops and kitchens must be mounted so that no point along the wall is more than 24 inches from a receptacle that means they're every 48 inches per nec section 21052c1 and it goes on to save receptacles installed to serve the countertop areas must be gfci protected according to nec2108a6 so all those two small appliance branch circuits in the kitchen will be gfci protected on page 48 on the bottom of the left-hand column it says it's recommended that no residential branch circuit be loaded to more than 80 percent of its rated capacity that's because it might be a continuous load and we don't know so 15 amps times 120 volts is 1800 volt amps but we want to take 80 percent of that so 80 of 1800 volt amps to 0.8 0.8 times 1800 volt amps is 1440 volt amps and then i have a note here that says what if the circuit's rated at 12 amps well we do uh i don't know if you can see my calculator or not can you see my calculator no i don't know if you can see my calculator but 12 amps times 120 volts is 1440 volt amps and then we have to multiply that times point eight eighty percent and it gives me 1152 volt amps 1152 so if it's a 12 amp circuit you do 12 amps times 120 volts times 0.8 you get 1152 on the right hand column of page 48 block diagrams a single line block diagram also called a one line diagram is typically used to show the arrangement of electrical service equipment a power riser diagram is a common example of such drawings power riser diagrams show pieces of electrical equipment as well as the connecting lines used to indicate service entrance conductors and feeders so a one-line diagram shows the incoming services as in general panel board schedules usually indicate the panel number type of cabinet either flush or surface mounted panel mains and amp amps and voltage rating how many phases single three phase all and then over on page 50 it can it finishes the thought it says and the number of wires so all that is shown on that power riser diagram here's an example on page 51 of a power riser diagram and again it's a one line this is showing the current transformer cabinet the ct cabinet the incoming incoming line is below ground below grade over here this is incoming there's the main distribution panel and here we're showing by these lassos uh what's contained in these conduits one single line shows that this is a number two it's a two inch conduit with four number two gauge conductors inside of it so it's a two inch conduit with four number twos going to these bus ways these bus ways are smaller they're being fed with three number six gauge in a one inch conduit so they're smaller and here is the rooftop unit number one rooftop unit number one that's for an air conditioner that's a fused disconnect uh oh no i'm sorry it says non-fused uh non-fused uh service switch and it's being fed with three number six gauge conductors and a number a one inch conduit three number six is in a one inch conduit so you look at the lasso the lasso tells you what's in that conduit this lasso is telling us what's in each of these five conduits this is a one line or power riser diagram over on page 53 there it's showing the most common used specification wiring format used in north america is the master format and in the master format division 26 is electrical division 26 is electoral and look our book number starts with 26. plumbing starts with zero two so they're using that master format um i don't have any highlights in the electrical uh specifications that go with our drawing so take a look at those read over some of them come up with some questions of your own pertaining to the specifications of that job of the job the blueprints and this concludes our video lecture on 26 110 electrical uh drawings i'm sure you have a lot of questions ask your instructor uh and as always work smart work safe and wear your ppe it's there to protect you thank you"

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{

"VideoID": "333",

"Title": "switch board wiring #electrical shorts#tips#learn#electrical#youtube shorts#shorts..",

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"Title": "Apprentice Electrical Engineer | Make It Into: Construction",

"URL": "https://www.youtube.com/watch?v=VpjTqjVASRg",

"Keyword": "Electrical construction techniques",

"Transcript": "hi my name's not like and I'm the practice electrical engineer these are both for mr. Gavin our news gives people good luck sample electrical engineers are brought in to basically set out the building with all the electrical needs from late the switches the plug sockets to whatever is needed as an electrical engineering practice I am doing exactly the same work as everyone else on said except I'm giving him the space to learn and ask questions and how it works I'm currently studying Electrical Engineering and I'd be here three days a week and in Springfield too so it's a bit of learning on the job and off the job so it's a better theory and it's also more practical before I started I was quite concerned I'd be free and the deep end but everyone has ticked at him and was able to explain it to me if I didn't know the fact it every day can't be different it gets a bit more exciting because you could be learning new stuff one day and the next day might be something you know and you're like oh I'd be able to go on and do this instead of asking questions about softener today and holding back maybe a wee bit more than showing someone that I can do this the way I think about it is don't care what anybody else thinks and the best thing for you to do is just get up look for a course and get straight to it because the more tame you is sit in a booth the more you overthink it and you'll just want to go do it anyway the fan don't worry about jobs in construction or other industries visit BBC doc okay slice me up you"

},

{

"VideoID": "335",

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"URL": "https://www.youtube.com/watch?v=68kuus5S\_C4",

"Keyword": "Electrical construction techniques",

"Transcript": "thank you [Music]"

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"VideoID": "336",

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"URL": "https://www.youtube.com/watch?v=qnYQg8dn0Dg",

"Keyword": "Electrical construction techniques",

"Transcript": "does electrical work have to be neat or pretty \nor does it just have to be done to code [Music]   what's going on my friends dustin stelzer with \nelectrician you and today we're going to talk   about this whole neat and workmanlike manner topic \nso in the national electrical code we have article   110.12 and it talks about the mechanical execution \nof work and kind of how we're supposed to i guess   people interpret take pride in our work or how \nwe're supposed to do things to be uh professional   so let's kind of break into that because that's a \nthat's an argued about topic right so out in the   field there's a lot of people that are kind of of \nthe mind that's like just do it so that it's done   right who cares what it looks like other people \nare like no like make it look like you're proud   of what you do take pride in your work and a lot \nof people are kind of in the middle like well yeah   both make sense so some people are like well if \ni can do it fast and get it done right you know   my either way my boss isn't paying me more to make \nit pretty but i mean even that's kind of arguable   it just kind of depends on the shop that you work \nfor so let's break into it a little bit just see   what the national electrical code says first and \nforemost so we're going to be going to 110.12. it says electrical equipment shall be installed \nin a neat and workmanlike manner so there's three   sections within that but just that alone \nwhat does that even mean what is a workman   workman a man employed or skilled in some \nform of manual mechanical or industrial work   so employed or skilled so if you have a skill in \nsomething what does it even mean to be skilled   having or showing skill expert or proficiency \nrequiring specialized ability or training   so as an electrician i am trained to do work \nby the people that i'm around and whatever   standard to that whatever they do work by that \nis all i know really until i get out there and   start seeing more people and more experiences \num so it's not really saying like you have to   do things pretty and aesthetically because pretty \nand aesthetically is a very very relative term but   the in term neat and workmanlike is specific in \ncode so to install electrical equipment just to   the minimums not going over crazy making \nsure all your romex is stapled perfectly   to me that's neat and workmanlike but some people \njust stapling it for code and who gives a [ \_\_ ]   what it looks like it's getting covered up \nin the wall that's also neat and workman   like right the neat is the part that i think we \nshould look at so the definition of neat means   free from dirt and disorder habitually clean \nand orderly it kind of seems like free from   dirt and disorder means like if you make a mess \nclean up your mess it doesn't mean do everything   evenly and perfectly and neatly and straight it \nsays marked by skill or ingenuity or precise and   systematic so there does kind of have this little \nbit of element of rather than just being somebody   throwing [ \_\_ ] up on a wall you install it you \nknow thinking about it orderly and systematically   and cleaning it when you're done and that's what \nprofessionalism is so that's really all it says   under the 110.12 mechanical execution work there's \nthree different sections there's a b and c so it   goes kind of more specifically for these three \nthings one of them is unused openings and it   says unused openings other than those intended for \nthe operation of the equipment those intended for   mounting purposes and those permitted as part of \nthe design for listed equipment shall be closed   to afford protection substantially equipment to \nthe wall of the equipment where metallic plugs   or plates are used with non-metallic enclosures \nthey shall be recessed at least one quarter inch   from the outer surface of the enclosure so that's \nspecifically for unused openings so they're saying   it's not neat and workmanlike if \nyou leave openings in enclosures   then we have the integrity of the \nelectrical equipment and connections   internal parts of electrical equipment including \nbus bars wired terminals insulators and other   surfaces shall not be damaged or contaminated by \nforeign materials such as paint plaster cleaners   abrasives or corrosive residues so again kind \nof just clean installs not messy installs is   what they're getting at there shall be no damaged \nparts this is another one you see a lot of times   somebody like shorts out a receptacle and they \nblow up that terminal but it's like i'm just gonna   shove it in the wall that's not neat and workman \nlike according to this for the integrity of the   the equipment you can't damage stuff there shall \nbe no damage parts that may adversely affect the   safe operation or mechanical strength of the \nequipment such as parts that are broken so   maybe that's a little relative because if it's \nnot interfering with the safe operation but   it's damaged it's really aesthetic damage so it's \nnot uh the integrity of the electrical equipment   another kind of relative thing there and then \nwe go on to cables and conductors so cables   conductors installed exposed on the surfaces \nof ceilings and sidewalls shall be supported   by the building structure in such a manner that \nthe cables and conductors will not be damaged by   normal building use so it goes a little bit more \nin depth on that but those are the three kind of   cases that the nec is really specific about even \nthough it's kind of vague what it means they just   give us a little bit more information now there is \none thing that's interesting to note they give us   an informational note under the very beginning of \n110.12 under the mechanical execution of work part   where they say accepted industry practices are \ndescribed in ansinica 1-2015 for the standard   for good workmanship in electrical construction \nand other ansi approved installation standards   so i actually went spent 44 dollars and bought \nthat standard just to see what the standard says   so nika 1-2015 good workmanship in electrical \nconstruction there's a whole bunch of different   sections it's kind of a long thing so i'm not \ngoing to go through every single thing in here but   it's worth note that they say that this is what \ncan be used as a standard that describes what   is meant by installing equipment in a neat and \nworkmanlike manner as required by the national   electrical code section 110.12. so the first \nthing to look at is number two standards for   receiving storing and protecting equipment lets \nyou know like basically just don't damage stuff   this is how you should store things so they don't \nbecome damaged number three is what i'm going to   look at is uh this is general requirements so this \nkind of applies to all uh work doesn't matter if   it's conduit wire anything like that it says good \nworkmanship shall be apparent in the installation   of all electrical materials and equipment \nequipment shall be level plumb and true with the   structure and other equipment also in a horizontal \nor vertical position as intended so no unlevel   conduit runs everything needs to be level \nessentially b all material shall be firmly secured   in place adequately supported and permanent \nmaterials embedded in concrete or masonry   are otherwise part of the structure are considered \nsufficiently supported c all hardware fittings and   accessories shall be of type designed intended and \nappropriate for use and complement the items with   which they are used d all materials and equipment \nincluding hangers supports fasteners or fittings   and accessories shall be corrosion protection \nsuitable for the atmosphere in which they're   installed whether located indoors or outdoors care \nshall be taken during the installation to ensure   the integrity of corrosion protection damage \ncorrosion protection shall be repaired during   or after installation e all screws bolts nuts \nclamps fittings or other fastening devices   shall be made up tight in accordance with \nmanufacturers and or listing instructions   so this is again you gotta install stuff to the \nlisting or to the manufacturer's instructions   f plans and specifications shall be carefully \nfollowed when installing equipment then we have   a little bit more specific stuff so there is a \nsection for anchors and fasteners then there's   hangers and supports have their own section outlet \nboxes have one so one example in outlet boxes   is outlet and device boxes shall be secured and \nrigidly attached or supported plumb level and true   so it's like just installing an outlet box is just \ninstalling and installing it in a neat and workman   like manner is to make sure that it's level and \nplumb and everything is straight and there's no   um you know damage or anything like that \nto it so if you're smashing in one of those   single gang blue boxes and you're wiring a \nhouse and you smash the box and it's cracked   get a new box is essentially what they're \nsaying we keep going on there's stuff   about junction and pull boxes it \ntalks about covers it talks about   the size and conductors and number of bends in the \nraceway uh should all be done according to code   um goes a little bit more into raceways and \nthere's a whole bunch of different things in here   it's kind of an interesting manual to look through \num talks about wire and cable it talks about   mounting equipment so all of these things is kind \nof like don't damage anything make sure everything   looks good it looks like you know it's all level \nand straight and that's kind of the whole point   when you're installing something make it look like \na professional did it don't make it look like a   handyman did it and i'm not crapping on handymen \ni'm simply saying that like a handyman is not an   electrician so a lot of handymen out there try \nto do electrical work and you can tell as an   electrician walking up right away whoa somebody's \nhusband just wired that it's not all right it's   completely wrong so the rightness or wrongness as \nthe uh code you know as a standard for at least as   a minimum things have to be installed correctly \nbut beyond that actually taking a lot of care to   make sure that there's no damage to anything \nthat you're installing making sure things are   done straight um and whatever you consider neat \nto be but you know like not dirty kind of clean   make it look like a professional did it so here's \nmy here's my thoughts on the whole thing [Music]   again this is my opinion get your fingers ready \ni'm sure you're ready to give me your opinions too   please leave them below make sure you hit the \nlike button and the subscribe button though first   before you scathe me with your comments \nnumber one we all need to be installing   to the code as the minimum standard code is \na minimum there is absolutely nothing wrong   with going over above and beyond and adding more \nstraps to a run if you think it looks neater or   you know doing things that are kind of like maybe \nupsizing your conductors maybe not during covid   because everything's so expensive but you get what \ni'm saying you can kind of go above and beyond and   there's nothing wrong with that while it may be a \nlittle bit more expensive and time-consuming you   can do it you just need to use this as a minimum \nso does that mean you can do sloppy work that   doesn't look good yeah i mean it does as long as \nit's done right you know and again this this ansi   manual is not code it's a recommended thing for \nyou to read to maybe understand what is intended   by the word uh workmanship or neat and workmanlike \nmanner but this is not code so you don't have to   really install things but if it's not in the code \nspecifically for that definition kind of up in the   air so i think always trying to educate yourself \non what all of the intent is behind code is also a   very wise idea and if they are saying that there's \nthese standards that are recommended that we use   within the industry i think that it's okay to \ndo that and try to adopt those standards [Music]   the next thing to consider is what are people \ngoing to think of your stuff and by people   i mean let's look first at just other electricians \nif another electrician comes in after you are they   going to look at your stuff and be like holy \nhell who did you hire like really did you get   a plumber to do this because this is this is not \nan electrician if people can say that about your   work i think it's worth evaluating your work \nand evaluating whether or not you're actually   a professional or if you're just kind of an \ninstaller out there trying to whip stuff up on   a wall and get paid so as a professional in this \ntrade as a professional in any trade i think you   need to be constantly pushing the boundaries and \nhoning your craft and getting better and better   and always trying to impress yourself that's just \nmy opinion though and that's just how i like to do   things doesn't mean that's how you have to do \nthem but other people other than electricians   inspectors if an inspector comes out onto a job \nand sees just sloppy crap work although you know   it might be technically right they're going to \nlook way closer than somebody that they know   the company has a excellent you know history \nof like doing really great work really clean   neat everything is thought out you the inspector \ncan just walk in and be like wow they thought of   everything this is great so they're not going to \nhave such a crucial eye on all of your stuff that   they might if they walk in and it looks like you \nknow a bunch of 12-year-old kids wired to plays so   again it's just a consideration something to think \nabout whether you do it or not it's up to you like   all of this is up to you really how you do work \nand whatever your standards are and that's fine   but the last thing to think about too with with \nthe people at least what people think of your   stuff is the customers right so like if a customer \nis gonna pay three thousand dollars for you to go   build a service what are they paying for for that \nthree thousand dollars when they go out there and   look at it they're gonna be like bro there's no \nway i'm paying you three thousand dollars for that   dog [ \_\_ ] right there look at my neighbor's house \nthat's clean that's super clean over there that's   three thousand dollars this is like 800 what are \nyou even talking about that looks like crap so   you have to think about the aesthetic you have to \nthink about what you're actually charging people   for and if you're doing clean stuff and your stuff \nlooks like better than everybody else around it's   easier to justify your pricing when you charge \na customer that so again that's just my opinion the last thing that i think is it is kind of a   again an opinion but a good thing to do is always \nput your signature on stuff i don't mean literally   go in and like write your signature on stuff if \nthat's what you want your mark to be that's fine   but i think kind of putting your own little twist \non things as long as you're doing things to code   and they're done well some people like to tape uh \nsolidly tape a conductor some people like to put   their marks at a certain point so that everything \nlines up some people like to do this like weird   spiral thing when they're taping conductors in \neverything you do how you fold conductors in boxes   how much wire you leave whether or not everything \nis perfect and straight when you do conduit runs   maybe you do these weird little offsets a certain \nway that you just like how that looks so you do   it all the time and when somebody looks at it \nthey're like oh whoa that's so cool it's clean   i think going above and beyond is an appropriate \nthing as you go through your career as a   professional as a tradesman as an electrician i \nthink it's really important that you're always   pushing your boundaries and always impressing \nyourself so while you may have an electrician   come in and say your stuff looks like crap but \nyou think that's the best work you've ever done   it's really up to you you're the one you know \nwith the liability on it but always just be   pushing your boundaries and trying to increase \nyour value increase your knowledge get better   at what you're doing otherwise why are you even \ndoing this you know go do something that you are   passionate about maybe so again those are just \nmy opinions share yours as i'm sure you will   thank you guys so much for your constant support \nmake sure that you like the video if you liked   the video make sure you hit the subscribe button \nsubscribe to the channel it really really helps me   out to keep putting content out like this for you \nguys for you to freely consume at your leisure hit   the little notification bell let you know every \ntime i have a uh episode out um also make sure   that you go to the discord group join the facebook \ngroup if you're more into the facebook thing or if   you're on reddit all the time we have a subreddit \nour forward slash electrician drake just put on   on the thing i don't know it's electrician you got \na subreddit so go over there post some stuff that   you find and and uh it's something that eventually \nprobably in the next few months i'm gonna start   doing reaction videos for or you know go over \npeople's posts and just see what i think about it   for any of you that care anyways enough babbling \nlove you crazy people i'll see you soon [Music] [Music] this can't music and video you"

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{

"VideoID": "340",

"Title": "Electrical Techniques Certificate Program",

"URL": "https://www.youtube.com/watch?v=t1rDVod\_dCI",

"Keyword": "Electrical construction techniques",

"Transcript": "(upbeat music) - I've always been kind of interested in the electrical field, I've always liked trade's hands on work. - I wanted to get experience in all the different\naspects of electrical. Residential, Industrial, Commercial, and electronics. - With an apprenticeship you kinda get thrown right into a job. I didn't wanna feel lost when I'm there, so with this program, it gives me the confidence\nso I can go out there and find work and do it with confidence. - I really like the construction part, that's where you're actually putting the wires through the walls, hooking them up to receptacles, switches, lights, I even looked up how to build generators. - With electronics, we do controls, we do construction, all of that hands on, I feel like that's when I'm, really at my best. Everything I was learning in class it actually does kind of come together and it's actually not as\nintimidating as it first seems. (upbeat music) Our program coordinator, Sandy, he's helped me out. I started a little late and he's helped me get up to\nspeed right from the get go. - He will spend the entire class explaining things over\nand over to make sure you've got it. - There's a lot of classrooms I'll pass by with a lot of different\ndevices that I know that next semester I'll be getting a hands on chance with and I'm excited for that. The aspect of industrial\nand commercial work is a lot more open and that's really what\nI've gravitating towards. - All the trades go hand\nin hand with each other, electricians are gonna be working side by side with plumbers. I hope to enter an apprenticeship\nonce I learn the trade. Maybe head back home and\nstart a business there, there aren't many\nelectricians where I live. - I'd definitely recommend the electrical techniques program. It gives you an idea of\nall the different aspects of the electrical work. Anybody who's curious about it, this is a great course to teach you a lot. (upbeat music)"

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"VideoID": "346",

"Title": "Electrical Blueprint Knowledge For Beginners",

"URL": "https://www.youtube.com/watch?v=SKGkP5E6Ke0",

"Keyword": "Electrical construction techniques",

"Transcript": "alright guys welcome back I just want to make a quick little blueprint video to try to help you guys out mainly for Edward but for others as well I'm sure this will help many people so here are some symbols here I haven't really ever seen a switch box but you got your classic 3-way with that s and a three underneath usually the S has like a dollar sign through it kind of looks like a dollar sign with a line through it like this with the line but anyways you got the got the switch symbol you got your standard receptacle duplex with two lines through it these can also turn sideways so this isn't just like one direction if the wall they're usually the the symbols would line up like this on a wall so if the wall is here you would see the plug that direction if the wall was this direction that would be turn 90 degrees going up and down the wall was over here it would be on an 80 degrees so just keep that in mind so you got your plug symbol and then this is a GFCI for the bathroom and stuff like that our kitchen it's a plug symbol with the letters GFCI and then switch receptacle as a plug symbol what's half of it black or filled in which which notifies that it's that plug is turned on by a light switch you got your 240 receptacle like your range in your dryer or your stove and your dryer has three lines through it so it's just a heavy-duty plug wall-mounted light fixture usually just see those in the bathroom like the vanity light haven't ever really seen the weatherproof light fixture probably isn't only done one in my life or actually a couple but yeah ceiling fans and stuff like that haven't really seen any much of those smoke detectors see those a lot SD instead of a circle telephone jack it's just a black triangle and then there's also like a hollow hollow one just like a triangle with just outline of a triangle for like either like for like TV or Internet stuff like that got you're a single switch I never seen a single Plex receptacle really that would just be like a one plug by itself not a duplex like a standard wall so that would be like for an individual a circuit or whatever like a freezer or something so there's a bunch of these I'm not gonna go through all of them you got your a four-plex that's just four plugs in a double game box um stuff like that so okay well I'm gonna switch over to a blueprint real quick I just googled this electrical symbols and electrical blueprint I assume to know this 150% so how I really looked at this but I'm going to go ahead and just walk you through it this isn't really the biggest wiring diagram so you're not gonna see what every single wire but I can just fill you in on how its how you can do it so right here you obviously have your single gang switch right here just a single switch and that's a switch leg going to the light so that line just notifies you that that the switch is turning on this light right there and you need a wire going from the switch to the light obviously you're gonna need a power source for the light as well so it doesn't really show that wire so anyways if you want more about that later I can try to find you a different print but you got your plugs here so like I was saying the plugs they change direction depending on which wall they're on so these just plug let's just make up a scenario that this is one circuit so this plug goes to here so you need a wire from here to here from here to here here to here so each box will have two wires basically so say the home run starts here got that goes to the panel and then you jump a daisy chain from this plug to this blood to this plug this plug so each box will have two wires so you get the idea on that and then you got looks like recessed can lights right here and you can also see our CLT which I've never really seen ever in my life but just looking at it assuming there's going to be I can light a camera above the kid this looks like a kitchen right here eating area so this can light is turned on by this switch right here so you got a switch like here and then you daisy chain these together so all three lights come on at the same time another switch here so this would be a two ganging box two switches like I was saying you got two switches here and a switch box or ticking box this switch leg goes over to here and this also ties in to this light so two wires in this box switch leg and then a daisy chain over to this so those two lights will come on at the same time but the dining room this looks like a downstairs for like a basement or something so there's a little symbol here for a wall light and then switch here for something looks like it going to looks like this switches going to the wall light on by the side of the stairs and then another light on the other side of the wall going down lower on the other side stairs and then looks like a dimming switch here or something whatever the D stands for dimmer switch dimmer switch is has there's a couple lights here looks like on the outside of the stairwell so mounted oh like light mounted on this wall and around the other side of the wall a closet light or something right here actually that's a bathroom so there's a switch right there and then you need a switch leg wire to turn on that light and then that's basically all in there but usually there's a bathroom fan and stuff like that so another switch right here dimming switch one in the middle of the bathroom and then a second one about the shower or a bathtub and then right here you got another switch right air going to the ceiling fan and then here you have a plug and a looks like a telephone outlet as you can see right there a telephone outlet this doesn't really have any cable or anything but it would obviously just show a cable symbol and then a cables we'll wherever it may be so here's a thought this is a mudroom or basically from Conan's outside the house or a laundry room so you got a plug there which is probably for your washing machine and that's just a 20 amp and then you have a switch right here for the light so nothing too intense it doesn't really show the wiring diagram but you kind of get the idea with the switch legs and how they kind of tie together from here to here or here here and here so so I have my phone crashed so anyways I just try to keep that in mind the wiring jumping from in-between this is just basic stuff not not anything like plugs and lights on the same circuit this would just be all plugs the way that I told you plugs together and then these lights together so that's the way I like to do it keeps it simple if you keep all the plugs on one circuit in the lights on the other circuit but a lot of people to save money and they will take power from the plugs and power up the switch box and stuff like that so that's a little more advanced but not too much but try to give you some basic stuff here so hopefully this helps you guys out so try to study this if you're trying to get into electrical apprenticeship or whatever if you just want to get more familiar with it or get more knowledge and hopefully this helps you out thanks guys for watching I appreciate it god bless I'm an awesome Esther day like and subscribe if this helped you out I'd appreciate it thanks guys see you later"

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"VideoID": "347",

"Title": "Best way to install ground rod #electrical #craftsman #dewalt #remodeling #tools",

"URL": "https://www.youtube.com/watch?v=q-46Ruirlh4",

"Keyword": "Electrical construction techniques",

"Transcript": "yes if you're looking a way to get a ground rod into your ground without using a hammer and messing up the tip on it check this out I picked up this hammer drill at Lowe's this is a Craftsman I'm using an adapter to use my DeWalt battery this ran me about 120 bucks and then I purchased this specially made adapter for a ground rod and this way I can use the hammer drill option and just Hammer the sucker in all the way so let's check it out [Music] foreign check out my channel for the full video where I review this product see you guys"

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"VideoID": "348",

"Title": "Electrical Construction &amp; Maintenance Certificate Program at Thaddeus Stevens College of Technology",

"URL": "https://www.youtube.com/watch?v=aIb\_lIVINNk",

"Keyword": "Electrical construction techniques",

"Transcript": "i'm samina martinez and i'm in the electrical construction and maintenance program i did electronics in high school loved it it's all brain and i wanted to do more hands i looked into thaddeus and i was like that's literally exactly what i want basically by the end of it you have a pretty broad knowledge of what to do in a commercial or industrial site you would know what electrical takes part in when it comes to a construction site so now i know how to wire like the inside parts of the house when it comes to all of that i was always worried about going into a work field like i'm so young like how am i supposed to know what's going on but after the first semester i felt ready i was on a site every day for like two months and i feel prepared for like any job that i go into [Music]"

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"VideoID": "349",

"Title": "Electrical Tips and Tricks to fixing Short wires",

"URL": "https://www.youtube.com/watch?v=E4cl5BgsUk4",

"Keyword": "Electrical construction techniques",

"Transcript": "hey on today's video we're going to show what we do when we come across this short wires you can't even get a plug in there or you can't plug out you can't work on anything so we're going to go over a couple of maybe techniques that I use and a couple different products that you can use that make your life a lot easier when you have short wires be it in a panel or anywhere else so first I'm going to show you the products that we use in everyday electrician life when we come across this first things first of course we have the wire nut so but there's a little bit of a technique to it that I'll have to show you but we use a wire nut and then we can extend that wire out okay the second product we have are these called uh geek Mars whatever that is so uh yeah it has a little release tabs so you put your wire on one side the short wire the other side just a piece of wire push it in the Box You're great and it uh you can interconnect these together slide them together they're kind of big and a little bulky but these can go up to I believe a number 10 wire so that's cool if you need it in a pinch so what's the downside to this is when you interconnect them they're not connected together so you couldn't pigtail anything down you'd have to they're just for extending wire that's all that these are really for now the other ones are wagos now these are the more popular ones these also have the release tabs which you'll put on the end of The Wire put another piece of wire in there put your device on it and it has these quick release tabs what's good about these is you've got this is for three wires uh this one's for two wires they're interconnected inside so if you had a wire going in or three wires let's say that we're short or I'm sorry two wires that were short put them in there and then you can come back out uh with one and uh you pigtail them down in essence so um yeah two in one out and they're interconnected together I don't know if you can see that or not so that's what's really cool about those they're small and compact then you put those on there and uh that's how you extend the wires and then you just uh push it in the back like they're wire nuts okay now next is let me show you what you do if you had to use wire nuts to do this okay to a trained electrician like myself I don't sweat this no big deal but if you're a homeowner what have you it's kind of a pain in the ass so it's short what do I do well get our strippers in the best we can grab a hold of that and take the end off first thing we have to do is strip it now we grab ourselves some Romex some scrap laying around and get a stripper in there kind of crimp it and muscle with it but and you pull it right out of that sheathing excuse me and then take it strip it back that's gonna be used for our pigtail now so you can see that I've already I've got it hanging out so what I do is I I bend it towards me like try to make it longer so I have somewhere for the some extra wire for it to wrap I hope you can see this and I grabbed the two wires right here and I just kind of just twist them together it's not that it's not that easy but see and you simply just twist them together with your side cuts lineman's pliers what it what have you now while you're twisting together because if you use the wire nut this wire would just pop out every time but now we have it twisted together we not only have the conductor switched together we have it being Twisted together all the way back there stick a wire nut on that so we know that it's tight our connection is good boom simple as that now to put a device on there we're good um those are the three ways that you can combat against uh short wires so all right hey thanks for watching uh please like share and uh go to uh liveelectrician.com uh taking uh live calls we'll walk you through whatever problem electrical problem in your house I'm your virtual electrical expert so I'll walk you through whatever problems you have in your house and um I'll shoot you straight and even if you need to call an electrician what have you I'll I'll let you know when that time is so you'll go to liveelectrician.com like share I appreciate you guys I want to give a real quick shout out to my ex co-workers You Know Who You Are love you guys I miss you guys uh take care keep up the fight try not to be too bored over there and uh yeah Fight the Power Man fight the power"

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"VideoID": "350",

"Title": "Light fixture above a vanity | Electrical tip #shorts #electrical #homeimprovement",

"URL": "https://www.youtube.com/watch?v=b9v8rzvXW6w",

"Keyword": "Electrical construction techniques",

"Transcript": " So what I'm going \n to do is just put this block all the way in the back, \n so then when I get a round box, I can just adjust as to wherever I want \n and I have something to screw into rather than using an old work box that just relies on the drywall \n to hold the fixture in place . If I have something I can \n screw into, I can just I'm not going to put this box in here, \n but I'm going to put a round box in here. But for right now, I'm just going to stick \n this outside the drywall. And then when I adjust my light fixture \n for above this mirror, I can do that later. I always find it better to \n just poke a hole out of the drywall and then move that fixture after it \n or get the mirror in, because sometimes the decisions aren't made on \n what light fixture you want, and you just want to make sure it's \n not too close to the ceiling and too far away from that mirror. "

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"VideoID": "352",

"Title": "Troubleshooting Electrical Problems - Step 1 - DIY",

"URL": "https://www.youtube.com/watch?v=CSFgtq7wLcs",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] hey there welcome to the virtual electrician tve your one stop shop for do-it-yourself electrical help in this video series i'm going to show you the proper steps to troubleshoot any electrical issue this first step is going to save you hours of troubleshooting if you just walk into a problem with no history or knowledge of what is going on then you may be in for a long day to save you all that time the first thing to do is very simple ask your customer if they were doing anything that made this problem occur or if it's your house and your problem think about what you were doing or what you have done recently that may have caused this have you been trying to install new light fixtures did you try to install a new switch or outlet getting these questions out of the way gives you a good starting point if the customer says that they tried installing a new outlet but after a few days everything in that room stopped working you probably want to start your troubleshooting with the outlet they replaced it's possible that they don't have a good answer for you and that the outlets just stopped working one day but even that gives you helpful information if that's the case maybe you start at the panel to see if something happened within the panel to create this problem the first step is a simple one ask questions like or subscribe to our page for more videos"

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"VideoID": "353",

"Title": "Being A Commercial ⚡Electrician⚡ - Shell &amp; Ground Up Electrical Construction Projects",

"URL": "https://www.youtube.com/watch?v=7Xha-33YYlo",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] hey 360 electricians good morning in this video you're gonna follow me and see what the typical day for a 360 electrician is like we're going to go visit a couple of job sites we're going to talk about the jobs themselves how we got them what we think about them and things that you can expect once you go to business for yourself come along hit the like and subscribe button let's get into the video before we begin though gotta get the coffee one of my favorite is ground up construction so it's new construction we call it ground ups and we don't do any of the ti work we only do the outs exterior and the underground and the main switch gear this happens to be a ground up of a popeye's chicken we're doing out here in good old southern california and we're almost done we're about ninety percent done on our work and when you do ground-ups usually for these fast food restaurants you are not doing any of the ti on the inside you are only doing the outside so uh you can see the parking lot posts for the parking lot lights the edison feed that comes out from over here comes underground and goes all the way out to that pole in fact we are already out to the alley and then uh we're gonna start the alley next week usually you do your main electrical switch gear which you'll see right here uh we almost exclusively use square d we like square d we've got a really good deal with square d and as you can see with ti work you're going to be doing some of the parking lot lights the posts you're also going to be doing the lighting fixtures on the outside of the building so ground up is super fun super easy to bid very profitable and just a good way to have work for several months let's go inside and i'll show you the interior we do very minimal work the ti uh electrician for popeyes comes in and does the finish work on the inside that's counters lights and all that stuff we could bid on it but this is a lot easier it's a lot faster and to me a lot more profitable so as you can see it's pretty much a shell on the inside and uh we have run our exterior light conduits our air conditioned conduits we do do our stub outs where we need to but we leave the inside to the ti electricians and we usually only worry about the outside they're starting to do the plumbing now it looks like you know if you've never done new construction or ground-ups and you're just a residential electrician it could be pretty scary trying to get into work like this but i'm telling you practice makes perfect you got to get into it you got to find some guys on your team that are experienced that have done this kind of stuff all my guys have so it's pretty much just working together getting the materials and most importantly following the plans all right so that was a ground up and actually i keep calling it a ground up new construction which it is but it's also known as a shell building so in other words again you're just building the shell of the building you are not doing any of the electrical work on the inside that's usually the ti contractor tenant improvement so i got this contract from the owner of the ground he went and built a popeyes he spends that money out of pocket he contracts out to his contractors he basically builds the popeye's building to spec and then of course company like popeyes will rent that property for a 10-year lease etc etc so ground up shells awesome awesome way to go if you can get those in your area again pretty clean pretty easy just follow the blueprints bid your project correctly always leave some extra for the unknowns what you want to do is also you want to get in touch with the utility before you even bid the job asking what their specific requirements are make sure you find out that you don't have to dig somewhere where you're not licensed to dig for example here when we dig on city or county streets we're not allowed to do that because we're not licensed for that so you got to make sure that in your contract you're putting hey you do all the digging you can throw the pipe in but then they're going to have to cover it up bidding on these is fairly simple you're going to get your complete parts list your complete fixture package you're going to send that over to your favorite wholesale house they're going to give you a material list and a fixture count list with a price on it you're going to take that price and you're going to estimate how long you think your crew is going to take to do this job now what i like to do is say i know this project's going to take 90 days but i know that we're not going to be here every single day for 90 days so i will take the whole 90 days and then i'll reduce it by 40 percent and that's my labor costs because again sometimes we're here two or three hours sometimes you're here two or three days straight but we're never here 24 7 because those other trades are gonna come in and work you can't be working while the plumber's digging up the ground because you can't get your ladders up or they're going to be excavating the outside or or grading you can't throw your pipes in so keep that in consideration but i highly recommend you go for these jobs now i have a little secret on how i pick up these jobs and we do quite a bit of them in fact our next job we're going to right now is in long beach it's a combination of a ti and a shell building it's a pretty big project let's go over there and check it out all right and here is our starbucks shell ground-up shell it's gonna be a starbucks a tenant unit and then over here is gonna be the jack-in-the-box and we haven't started that yet so this is a pretty big project we've got a couple of dozen uh parking lot lights going in here and then our ti is the existing building it's a tire store let's go over there and i'll show you that so you can see the ti we're putting in all new led lighting and over the racking as well so all those lights all these lights are new new lighting got two new bathrooms going in there got a new sub panel over here so the office is moving pretty slow but it's been framed up the rough has been passed and uh we've got some more work to do so this is just a interior ti the bathroom bathroom fan you know you get your switching in the walls and uh hvac line up there just the typical ti moving really slow this is still early on even though he passed rough on the bathroom this bathroom is going to get demoed as the old one and all this will be full office space so i really hope you like this video these are just uh some jobs that we do here at 360 electrician and some that you can expect to do once you go into business for yourself"

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"VideoID": "356",

"Title": "Construction Top Tips - Electrical Safety Tip 4",

"URL": "https://www.youtube.com/watch?v=zgaP87YvQcI",

"Keyword": "Electrical construction techniques",

"Transcript": "Safety on site is a joint effort. It’s never a single solitary person; it’s everybody works together to achieve one aim and that one aim is for you to go home. That’s all it’s got to be. The more that you think about safety, the more that you apply safety, the more likelihood it is that you’re going to stop and ask questions if there’s a doubt and you get to go home. So, starting from the principal contractor on site, to the sub-contractor to the employee – they all have various roles they’ve all got different aspects they need to think of, but at the end of it, it’s all about can you go home – can you go home safely. So whether it be working in and around electricity, whether it be working at heights – whatever it is that you’re going to do if there is any doubt at all, if you think, ‘hey, this doesn’t look right, doesn’t feel right, it doesn’t smell right’ then ask questions. Stop. Have somebody look at it and then when you’re satisfied, get them to show you – yes, this is right – then you can proceed. Because it’s the people that don’t stop and ask questions are quite often the ones that get hurt. Because they aren’t considering their own safety."

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"VideoID": "358",

"Title": "Program Information Session ~ Carpentry and Renovation Technician / Electrical Techniques",

"URL": "https://www.youtube.com/watch?v=YAFUXjZgxu0",

"Keyword": "Electrical construction techniques",

"Transcript": "uh one of the important things to note is that this has been a hybrid delivery for this program specifically so we do have on-campus activities that have occurred over the last few months and that is our expectation and hope going forward in the fall we are trying to make sure that by the end of may we will have defined um outlooks in terms of what the program availability is going to look like how that's going to work for you and whether or not you're going to have that ability to know exactly what classes are going to be in uh in person for you and for most up-to-date and accurate information if you want to make sure you're keeping on top of this we do keep it up to date on our website so please know that you are our focus we do appreciate we very much believe in the importance and practicality of hands-on learning especially for talking about trades and programs that have you actually building and constructing things before we kick it off today and turn over to our amazing faculty i'm really happy to announce and say that we've actually been joined by niagara college president sean kennedy and i'm gonna flip it over to uh mr kennedy real quickly and he's got a few words for the group excellent great well thank you uh very much kyle i want to make sure i am off mute indeed i am um and uh i i truly i just wanted to say it's a pleasure to be able to join uh the group today uh i i think that uh you know nothing is as good as being on campus to see our amazing uh facilities uh firsthand and our amazing campuses and the feel the the sense of warmth uh that that and the dynamic energy that that you get by being on campus uh having said that uh i hope that all participants will have a chance through this virtual open house to get their questions uh answered to be able to to talk to to our amazing faculty and and also to see some of those there's a virtual tour that's always available and some of the the different program specific curated uh tourism of different spaces which which will give a glimpse uh for those of you that haven't seen our campuses and facilities first and a glimpse of of the amazing uh learning environments that we have at niagara college one of the things that naira college really prides uh itself on that we're so proud of and and always focused on is ensuring that we put our students first and that that uh we we are a caring community and and i think i hear this frequently from from newly uh new employees and new students that they get a sense of family at niagara college now we talk about it often and it is really true i always think of niagara college as being big enough to have everything that a student could want in terms of opportunities and facilities but still small enough so that you're not a number uh and that that our amazing faculty and staff uh will will be able to know your name uh support you and that you'll have a chance to to meet one friend make friends meet meet one another and feel that sense of connection it's really really important to niagara college and given that that i'm talking about nyar college as a family i should just talk about my own family and particularly this program i'm very proud to say that my son is a graduate of the carpentry uh and renovation techniques program uh he had an amazing experience and i i can say as a father of a student that graduated from this program uh any any student that joins this program will will have a terrific experience uh like all of our programs uh high quality you know it's comprised of really high quality uh curriculum uh in terrific faculty and facilities and then part of of a broader learning environment that as i said you know at the beginning of my remarks really is is focused on students and making sure that that we're we're always working to support our our students uh well-being uh and and success so with that i will turn it uh back to you kyle okay i think we're ready to start our session um my name is annette dearling manchester and i'm one of the full-time faculty in the carpentry and renovation program and i'm also the program coordinator and with me today is colin robinson who's another one of our full-time faculty and we also have one of our um second semester students with us oops now i don't know what's going on um megan is going to speak later on a little bit about our program basically it is that if you have any sort of interest in um construction or improving existing spaces or building new construction our program is probably what you're looking for we also do touch a little bit on commercial spaces as well as residential spaces so i want to just talk a little bit about the actual programs themselves we have a one-year program called the carpentry and renovation techniques program and it's offered in the fall winter and spring at the wellin campus at the end of that one year you have gained some really good skills in the industry and there are lots of career opportunities for you at that point as you can see on the screen um i'd like to just tell you a little bit about the courses that you take in the one year program you get a lot of your sort of basic entry level basic skill courses to get you started things like blueprint reading health and safety and then in term two you get a little bit about building codes estimating but in both those terms you get a good portion of the time in the lab actually physically doing things i would say at least half your time is in the lab so at the end of that one year you could leave and you'd have a certificate a college certificate we also have a two-year program and actually the first year of it is the same as the one-year program so if you've done the one-year program you can continue and do our two-year program it is also offered in fall winter and spring and the nice thing about our two-year program is that there is a co-op placement uh between the first and second year depending on when you take the program okay and um at the end of the two years you leave our program with a diploma a college diploma as opposed to a certificate and again you're very well equipped to enter the industry uh more well-equipped than if you just done the one year so some career opportunities after this two-year program are a little more advanced positions that you could get into and again some commercial applications you will have learned in second year as well as some renovation applications in second year and that will show up when i show you what you can take in the second year i just want to stop here for a minute and actually explain co-op to everybody because if you're coming from high school it's a little bit different than a high school placement our co-op placement is a paid work term and it is uh four months in length and you'll be working directly in the industry and the college co-op department helps students prepare for and apply for those jobs with employers who have registered with the college and we have historically had a 100 percent placement rate with our students in the industry for many years now and we're pretty sure it's going to be like that for the foreseeable future the uh indus the construction industry in niagara is booming and there are probably more jobs than we can possibly produce students to fill so that's your co-op placement and um in the second year as i said we get a little more advanced courses you get a little bit of design courses cad building codes again and construct commercial construction and renovation construction and green building practices also again you spend the majority of your time in the labs with hands-on work so some of our program highlights there's a couple of pictures of actually some people working in our lab and one of the projects that our students have been working on as i said we have a high there's a high demand for the graduates of our program do the due to the chronic shortage of skilled trade workers in the construction industry okay now i just have a couple of slides here of what our actual campus looks like if we have time at the end of this session we do have a really great video to show you as well we'll see if we have time at the end so this is the entrance to our main um uh shop lab tc 177 and when you enter this is some of the views you'll see it's a big open space very flexible all kinds of activities happen in here um from framing to drywalling to trimming to all kinds of things happening here colin teaches a foundations of building foundations course in here with all kinds of different ways of doing it so you can see that the space is well utilized one end of it is more for sort of woodworking and the other end is more of a big open space and everything has its place and everything is neat and tidy we're very big on safety and tidiness and we have a fantastic technologist who looks after the shop but also the students are expected to take good care of it as well and keep it tidy outside of our shop we have a compound area or an outside area where we do some outside activities so you will be experiencing some work outdoors and some some things like roofing we do outdoors and this is one of our projects we're working on right now it's a small house project it was actually built in the shop in um and it's a modular kind of a build it actually was made in two pieces that was disassembled moved out of the shop and reassembled out in the compound and now we're working on finishing the interior of this project so i'll hand it over to ian he's going to talk a little bit about the electrical programs thanks annette appreciate it um so i'm going to speak fairly briefly about the electrical programs college has an electrical techniques program which we'll talk a little bit about today um in terms of just one moment it's a one-year electrical techniques program and that program is located at our well on campus the weldon campus is our our trades campus and that's where a lot of our construction and electrical programs are located so it's a one-year program you need your grade 12 uh english and then a grade 11 math so students that are coming out of high school would be looking to gain experience in in the electrical field to potentially either either apprentice or um or to build on that education and to look to work whether it's as a as a residential electrician or or obviously look into commercial electrical or lots of different options um the uh the welland campus is actually probably about a little bit bigger than our niagara on the lake campus but we've got a lot of our programs clustered so that you guys as students would be experiencing not only the construction program you'd be working side by side with the electrical program our automotive program our green technology program a lot of those programs are all on the well on campus go to the next slide the electrical techniques program like i mentioned uh one year credential so it's one year certificate i mentioned the grade 12 english um and then the grade 11 math so that's great grade 12 c or u english and then a grade 12 sorry grade 11 c or u math the math is important obviously in electrical there's lots of different components whether it's circuitry the the basic math um you will be getting into math in that program so it's definitely important to concentrate on your grade 11 math and try and learn all of all of those concepts so again this gives you an idea of our facilities i've been on campus in the welland campus i've also checked out other other college campuses in terms of the facilities and i'll definitely say that the electrical techniques students get access to as you can see here in the photo just a fantastic facility in terms of uh wiring running wires doing all of the hands-on components in an electrical career so students are getting the the foundational experience they're learning the basics they're getting their hands in in and on the work they're working on lots of different projects and that mentioned the the tiny house project the small house project lots of students from different areas are getting getting experience doing stuff that they will be doing in in their career so obviously you can see their the career opportunities so the electrical apprentice so students would complete the program to give themselves those foundational skills and then uh working with the college or on their own look to find a journeyman or someone who could who could apprentice them and they could continue to build on their apprenticeship and complete the further years of their electrical apprenticeship um different technician programs um lots of different opportunities but the biggest thing i'd like to kind of confirm with everybody is getting that one-year certificate really gives you the experience where you would be then beneficial to an employer you would have the basic skills to be able to be useful on the job to be able to build your skills um on on a work site whether it's commercial or or residential so the other thing i'd like to mention um some students on the call if you're high school students you may have uh taken a specialist high skills major in high school so that's a chisholm scholarship niagara college has a one thousand dollar chisholm scholarship so if you if you've taken a chism and you're applying to a construction or an electrical program at niagara college you may qualify for a schizome scholarship so it's it's a thousand dollars um you need to complete your chisholm in high school so complete all the components in high school you need to graduate obviously and you need to have uh an 80 in the required courses so for electrical techniques which i'm chatting about today that would be your grade 12 english and your grade 11 math so we're not looking for 80 in in all of your courses we're really just looking for the 80 in those required courses um there isn't a separate application if you apply to niagara college and we notice that you have a chisholm and you have the academic the 80 um that thousand dollars would get uh would get added to your student account so it's a great way to build on that chisholm um and a lot of a lot of the faculty find that students that are coming in with that chisholm from high school they've been exposed to some of those construction and electrical courses in high school a lot of times that gives you a good base to come in and really build on your high school learning uh with colin and annette and the great faculty in our construction and trades programs and we're going to quickly turn it over we're we're very lucky to be joined by megan today um she is in the second phase of her program so she can be able to talk to us about what it's like to be in the program what it was like to study over the last year obviously with some i would call it challenges as for a couple and then also what it's like for her to continue to be at niagara college thank you so much for joining us megan yeah of course um can everybody hear me is it working okay yeah okay perfect so i was asked to speak on three different things um why i chose niagara what i love about being a niagara college student and how i feel is supported by the faculty and staff so um initially when i was choosing a college i was looking for sort of an interior design program which is completely different than what i actually chose but um i chose this program specifically because um without having like knowledge of building practices and knowing how to really like make a building i really couldn't um do any sort of interior design so um i chose renovation um once i had it set in my mind i spoke with some people that went to niagara college and kind of went through their experience and um figured out that uh this was the college for me because it like it really makes your dreams come true like they really do put in all of their effort to make like everything line up basically um and at this point in my carpentry career i feel confident with my skills to move forward as a tradesperson in the industry and i'm proud to say that i go to niagara college um some of the things that i love about niagara college is that niagara college has given me infinite opportunities to like really grow as a person and as a carpentry student um i started with absolutely no knowledge of building and not even have know how to read a tape measure or anything like that so you can really come with the bare minimum and really build your way up um did you do what else um so they basically gave they started with giving me the bare minimum skills and kind of built me into a trades person which i really appreciate um how i feel supported by the faculty is um i've been really grateful to go to niagara college because i have like they have the best stuff in the world really um they're the most giving loving and kind people that you will ever meet um they want you to succeed and they're they push you to the greatness that you can accomplish which is huge for me um i had like a lot of tough moments through um my niagara college experience but the staff really like got me through everything and pushed me through um the worst times that i had um and i really can't thank them enough for doing all of that for me um beyond the niagara college professors um they have a nc sac team which is uh their student kind of system that sorry um so they're basically the online version of your student success team in a way they do a lot of like giveaways and um different like games online which has been like really fun i i always sign up all of my friends which they love andy but they have a good time so it's always good um and it's a good way to get um prizes they advocate for mental health and they're always there just to talk um and if you're really having like a tough time at niagara college at all you can always speak to the counselors they're readily available and it's really easy to get a hold of people um and i've really never felt more cared for than i have at niagara college so yeah if you have any questions you can feel free to message me at all and uh i'm sure i can probably write my email in the chat if you need anything but yeah that's everything that's awesome thank you so much megan we have a question in the chat here and i think colin or annette might be the the best people to answer this so they were asked what what do we think sets the niagara college carpentry and motivation technician program apart from other schools programs what would it be and i mean megan's talked a lot about the student supports from the faculty side what do you think sets us apart you want me to jump in lemonette sure colin well good afternoon everyone i've been unusually quiet it's not in my nature to be quiet so uh that's that's different for me um i've been at niagara college for a number of years now and our carpentry and renovation team is comprised of really awesome industry experienced trades people you know everybody that's involved um are people who made choices to be carpenters designers electricians whatever that whatever that path was and have then made a choice to come into the teaching realm and deliver that so you know you have people that have a real legitimate industry depth of experience who are making a conscious choice to sort of spend time and give that back and teach into those you know their specific areas of expertise so i think that is one of our strengths we have good teaching spaces we have uh solid facilities solid you know tools resources all of those things we need and when all those things come together i just think that we can do a really good job preparing you for for your entry into the industry so i think it's just a blend of of a committed team and the right spaces the right supports i think it comes together to create a good experience awesome question it was quiet see yeah let's keep the questions coming guys you do have megan you have an actual student here you have a net in column with you as well uh maybe to help facilitate some of those questions we do have a video for you hopefully this will give you a you know as best as we can live in-depth look what the facilities actually look like at niagara you may recognize someone from this video hopefully so we're gonna get that started up and you'll be able to watch this video with us hi i'm colin robinson and i'm one of the professors here at niagara college in the carpentry renovation technician program welcome to our virtual tour of our spaces and a bit of an introduction about the program we are currently in a space formerly known as tc 177 it's our shop space our lab space for most of the uh construction hands-on trade related pieces and um we're going to talk briefly about the program and about what we do here at niagara and whether that's the right fit for you so the carpentry renovation technician program is a two-year program we also have a one-year techniques parallel program and the two-year technician program offers you the opportunity to achieve a two-year college diploma while gaining all of the introductory skills and sort of qualifications to enter the construction industry so we do that with a wide range of courses and content a lot of that content is specific to getting you that first job getting you out in the industry getting you working and with the range is going to go from blueprint reading and drafting through concrete forming residential framing interior and exterior finishes construction material sciences again this broad collection of courses that are intended to give you that head start to get you into the industry so you know if you are currently finishing high school or perhaps even considering niagara as an entry to a second career you're going to want to have that high school diploma with a basic level of math and english and any tech associated courses are also valuable to get you well prepared and qualified to join us and the program is uh the technician program is a two year five semester program two semesters in the first year a co-op semester which is a paid work cooperative semester through the summer or i'm sorry through your level three through your middle semester and then back for two more semesters for us um so the um again the program is very much focused on getting you prepared to enter the construction industry and uh i'm standing again in tc77 so this is a space where we do our big box work we're gonna do framing concrete forming uh drywall roofing any of those associated skills the hammer uh sort of carpentry skills and this is um one of our spaces and we're gonna have a bit of a look around here okay so again we're in the wood shop and tc 177 of our shop and just want to have just a brief brief look around here the space is quite large and we are equipped with really everything that we need to do some quality woodworking make some interesting projects so that's going to range from sort of several table saws we have um i think five table saws in the shop presently we're going to have bandsaw operations wood jointer planar operations we have in the sort of in the perimeter and in the distance we have sanding stations miter saw stations we have bloom mini presses for cabinet making router stations we have a series of cabinet maker pieces in here sort of higher end shop tools that you're really not going to see in the construction carpentry industry but very nicely equipped with overhead sanders panel saw thickness planer edge bander all of those pieces of equipment to do virtually any kind of woodworking or woodworking training that we may need to do and if we kind of glance overhead you'll also notice that we have a a very well outfitted and equipped dust collection system in the shop so when we're running the dust collector we can have all this equipment running and we're still going to be collecting you know the vast majority of that dust leading to a really sort of clean healthy workplace if you look around you know with this piece of a virtual tour the shop is clean it's always kept that way both by the dust collector by our shop technician and by student practices we like to keep the shop in a very orderly manner safer healthier everybody does well okay just another sort of point of interest on our shop tour the industry uses you know all of these portable power tools whether it's a cordless drill or router or sander or skill saw the the pneumatic nailers all of these things are obviously used in the industry and they're an integral part of the training that we do and again just i guess sort of showcasing that we are geared up with everything we need to do quality delivery and to um you know give you that give you that start that you deserve and you're in your carpentry career okay so just a bit of a capture of some of the other things that we're going to be doing in the main shop space it's not a wood shop program we have an awesome wood shop and we have courses on that but in a space like this we might be framing residential framing out of wood another piece that we do in the program and it's a terrific piece of employment in the future is the commercial sector so we'll do commercial steel framing we'll do drywall suspended ceilings floor systems commercial hardware some of those parts and a lot of that work is actually sort of evident and is done on our mezzanine space here on the sort of upper workspace so we have these different zones and different applications within the shop that allow us to do a real diverse variety of training within the one space we might have one set of students coming by that are doing concrete forming in the morning and in the afternoon the space sort of flips over and becomes commercial drywall installation so all of those different labs can be facilitated within this space okay so we've stepped outside of our shop into sort of a compound space and we'll use this space everything from mixing concrete to doing a surveying and building construction layout lesson outdoors the industry does exist outdoors and we head out there when it's practical a bit of a backdrop here uh some of the student projects that are always ongoing um each semester the course outcomes are the same the learning is the same but we're in a constant state of kind of invention and revision about what the project looked like any specific semester this group of sheds behind me were produced by the students during framing classes and then exterior finishes classes so the students were able to go through all of the components of framing a small building and then in their next semester courses they go through the processes of you know how do we install the vinyl siding make sure the building is waterproof install the roof treatments even some very small sort of deck details here so we incorporate as many of those sort of legitimate real world practices even if the projects are a bit scaled down to suit the college environment uh the students uh you know go through that entire and through that entire process okay so we've moved outside but then back inside we're actually inside of another student project that's uh currently on underway this is a two component modular small home not going to use the word tiny house this is sort of a modest home and we're doing this as almost a a bit of a exploration or an experiment to see if in fact we can bring real decent quality construction techniques and processes into a small home market to perhaps address you know the need for affordable housing for so many people and the students have been working on this now for a couple of semesters and the concept here is that we're going to take all of the standard sort of good industry practices roll them into a very small one-bedroom home and and sort of have a look at the cost to both produce that and what it would cost to own and operate that so a little bit of a little bit of an uh looking out type project to see if we can uh maybe address some of the problems in the community and give the students an interesting project at the same time so this is the type of thing we're doing hi my name is annette dearling manchester and i'm one of the full-time faculty here in the carpentry and renovation program at niagara college and i'm also the program coordinator i've had many years of experience in the industry as well as many years of teaching behind me every year we get a great group of students join us a lot of them come directly from high school or else they come from other careers and they're thinking of making a change we're also really delighted when we get a handful of young women joining our program we consider ourselves to be extremely inclusive here and really it doesn't make any difference where you've come from particularly if you have no experience at all i don't want to discourage you because we have lots of students who have never picked up a hammer never done anything in the industry and they are just curious about it so it's the kind of program where you get a lot of hands-on experience and we also have some really good academic courses so that when you go out in the industry you're very prepared for that first job some of the more academic courses are things like um blueprint reading drafting project management estimating green building practices is one that we do in the last year which is a very relevant and current course at the moment it's always a fun one because we have to keep up with what's happening in the industry and so you can see that as well as getting a lot of hands on time in the shop we do get a lot of time to talk about what else is happening in the industry thank you very much for coming to our open house certainly if you have any more questions we are always available to answer them you can get in contact with any of us or with the program itself if this is of interest to you we'd be delighted to see you in our program so hopefully that helped provide a little bit more insight one of the questions we had that popped up in the q a that i think would be great to get a student perspective on is somebody asked about um going into the fall what it would look like about courses being split between online or the hands-on course megan from your perspective what was it like to be a student this year and did you feel well accommodated with that what was it like to actually complete course content so when i started initially i thought that um everything was just going to be like it's all in class they're all online so with having a hybrid um course it was really fun to kind of adapt to like being online and being in school right because you'd have some lectures online for your in-class stuff as well as your online courses but i felt like the balance was really good um i went to school for three out of my seven courses in the first semester and four out of the seven courses in the second semester but i also felt like the courses that were online were totally doable online the teachers definitely made um commitments to making sure that you really understood what was going on and um even for something like blueprint reading where i felt like we could have been in class for it and that really adapted and she really made sure that um you felt like you knew what was happening so i felt like it was a really great program and i felt like it was worth every penny so yeah all right we have another question that's popped up um so we see that other schools include hvac and plumbing welding classes with the carpentry rental programs are any of those touched upon through nc's offering of this program that feels like a question for me so um we are specifically a carpentry focused program but having said that we have a course excuse me we have a course in the second year which is um just generically it's called mechanical installations and it is an introduction to hvac plumbing and electrical um we again we've we've built the course around a carpentry focus now it doesn't mean just framing just woodworking you know i feel within the carpentry sort of realm we get uh you know exterior vinyl siding we get drywall we get roofing we get all those trades that essentially you know incorporate hammers and saws and and all those processes so and the other piece that we do relative to hvac plumbing electrical is through blueprinting through estimating through some of these other courses we are um you know exploring those pieces as part of the building system you know if we're talking about managing um energy and heat loss and all these things we do get into um discussing hvac design things like that um but it is a a component of the course uh the program is carpentry driven but we do have uh an introduction to all those trades predominantly so that we understand how they all interact to form a building and how the different trades work together but um it's a a a course and some components um within a carpentry focus program yeah one one piece i always like to put out during these types of events also is you know the questions don't have to end in in seven minutes all of us are available via email um you know if you reach out to the college um you you can you can access any of us at any time and we'd be happy to to respond or to follow up with any other questions um if you you know don't have our emails specifically you can just go through the college um you know through recruitment and and these people they'll get it over to us or they might answer themselves um and just relative to kind of you know the people that are here presently myself being colin robinson my emails just see robinson at niagara college dot ca so very accessible that way uh literally 24 7. i sort of open my email every day and if there's something i can do happy to do so uh so again another question so there's specific lists of general ed courses that they have to choose from or can they pick any class offered at the school so i'd be happy to help with that one um you do have a requirement for a general education elective as you move through we have a wide variety of general education electives so many students will look to diversify their interests maybe they'll take something like song writing maybe they'll take you know an additional math or something that would be more beneficial to their continued career within the trades so there is some flexibility for students outside of the core courses of course on our carpentry and renovation technician website you'll see the course listing by semester so those core ones the ones you have to take and the general education electives actually are fairly varied in terms of the opportunities for you colin would you mind kind of expanding a little bit on on where some of our grads go in terms of local companies or whether you know self-employment or working for larger builders that kind of stuff what what some of the options are for students sure um the the first piece that i'd like to touch on sort of with that topic is that um over the entire time that i've been with the college our program is um i'm going to claim and this is a number that i've made up by the way 100 of our graduates who uh have sort of done their part have chosen to find employment in the industry are doing so they're working in the industry uh you know we have certain grads that might take the program almost as general interest and not find employment so the actual posted statistics might not seem uh quite to be 100 but we have a very very strong employment uh history with the students in the industry and um the majority of the students i think are heading into the renovation industry the majority of those students are starting on entry level positions with local niagara renovators it's a very large industry in niagara a very busy industry in niagara and uh students are starting in those jobs we do have a bunch you know again over the years as as the numbers increase um we have plenty of students that have chosen to specialize we have students that have um you know become a trim carpenter or become a kitchen cabinet manufacturer installer um we have um i actually actually mentioned to the panelists not to the attendees but i mentioned to the panelists that i'm at my son's house this afternoon because when i'm done this conference call i have to return to drywall in his basement and he has a friend who is a grad of our program who ended up joining the drywallers sort of tapers union and uh has built a really nice career as a uh as a union um member doing commercial drywall steel studs ceilings all the things that that trade does and is is being very successful is having a good run so the jobs are across the industry it just doesn't matter roofing siding windows doors kitchens decks and fences landscape construction we have grads represented in all of those areas that's perfect thanks colin just gives everybody an idea where where they go afterwards right i think everybody has a general idea of what what's next but megan's probably thinking about that for when she finishes so it's good to hear that's great yeah one of the pieces that i think is valuable um from this program is that many people perceive carpentry and construction to be you know framing houses somebody's going to become you know a carpenter which means they're going to frame a house and that's a great career but it is a small slice of the potential employment um and sometimes um by design the program has this broad spectrum of things that we do you know again from roofing to drywall to siding to cabinetry whatever it is and students commonly will discover something that they would not have considered to be an employment path and find something they like to do through the through the college experience so i think that's valuable also i have a student one of my classes right now that i'm teaching this semester is construction surveying and layout and um i had a student in that course ask me this week if that would be an acceptable co-op experience if they were able to get employment with a surveying company doing that type of work i responded absolutely that would you know within the industry is our is our framework doesn't have to be swinging a hammer and uh that particular student apparently has sort of has an in has a good opportunity to join a surveying company for um for their co-op i think that would be a terrific experience there's there's just a really wide range of options okay well that seems like probably a logical end point i don't see any more questions so we want to really uh thank everyone for coming today i really appreciate you being here we appreciate all the great questions uh please remember that these recordings will be available for you afterwards additionally um colin's giving you his email uh megan has also reached out to you as well so know that we have lots of great support here at nc and uh you know kind of colin was saying we don't understand today if you have questions if you do some more research or maybe go home and speak with a parent or guardian please get back in contact and remember the asking anything is currently live on our website so if you want to go out and look around or maybe look some other programs you're able to do that as well so thank you everyone for attending thank you so much to annette collin and megan for joining us and providing all of your expertise i hope everybody has a great saturday and a great weekend and hopefully see around the campus before too long"

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"VideoID": "359",

"Title": "Ep-2 How to calculate Electrical load | Electrical Load Estimation | Load Calculation Sheet",

"URL": "https://www.youtube.com/watch?v=IebflvdLVvM",

"Keyword": "Electrical construction techniques",

"Transcript": "hey welcome back in this video we will discuss how to prepare the electrical loads it for a project is you see over here this is the basic structure structure as we discussed in the last video by the way if you have not been through the last video I am putting the link over here on the cut button so that you can go through and learn some things on overview how I maybe works how the designing process you can learn from there so before starting this video we must know what is the electrical load state why it is calculated and what is the need of it basically electrical load is the power consumption by an equipment it's called elliptical load and the unit of it is like what kilowatt megawatt etcetera and the electrical load is calculated total electrical load is calculated to know what is the total demand load what is the total power required for a project so let's start the project basically it's a ready suit yeah this is a ready hit with all formulations ready you don't do you don't have to do anything you only have to put the data over here and you will get the required the desired output over here basically there are two three types of load as you see over here there is a drop down one is small power one is lighting one is HVAC one is pumper motor once you select your small power you see automatically that format goes to 0.7 is a diversity vector if you select the over lighting over here it goes to 0.8 as diversity factor if you select HVAC over here it goes to 0.9 as diversity factor if you get select is to pumper mortar it gets through one is the diversity factor so here again the easy drop down before suppose there is a meeting room let's go through in detail supposed to area name is meeting room and the equipment in usage suppose there is a concealed ceiling light and as we know the lighting is lighting falls under the lighting load that is not run a small or not H which the its own lighting load so let's select your lighting and the diversity factor automatically goes to point eight and suppose one light consumes ten watt and the quantity of lights are ten so the total connected load is hundred and the open diversity factor demand load goes to eighty suppose in meeting room another power consumption is there suppose they each computer point how many computer what type of load is this it is small power you have to go through the drop-down and select the small power and suppose it consumes commonly mostly computers consumes 150 word so consider 150 over here and suppose they are provision of four computers so that total connected load goes to 600 word actually selected small power load type over here the diversity factor automatically goes to 0.7 as you see you in the demand load is 600 open four point seven equal to 420 light weights as you need do fill up the data over here you have to just select the equipment name what type of equipment you go through the drop-down and select over here if you find something missing do add here like wall light night lamp either what came to my mind I have added over your a few ting something left or missing missed over here you can go through and add it over here you must know how to add on Excel how to add drop-down in Excel if you have some query and on how to add how if you are failing to add do let me know in the comment section so that I will make a separate video on how to add the drop-down or Excel something so let's go to next then you have to select the load type what type of load is that if you select here it's a supposed Geezer right suppose type here is toilet right equipment name is Giza and the load type is as we know it's small power suppose that consumes 500 word and quantity is 1 so that total connected load for Geezer is 500 watt and as we selected small power here the diversity factor automatically goes to 0.7 and the total demand load in what it goes to 350 watt as you fill up all your required data over here automatically at the end the total demand load code changes and the finally you get it in kilowatt its 850 upon 1000 that is 0.85 here in this way you can get the total required load in the next is from the total required load we calculate what is the line current what current line current is there so that we can select the cable or wide sides what needed for that for the cable or wire size calculation we will go in a separate video otherwise this video will go Linde and one more thing you can use this seed use this excel sheet for you further use it's totally ready you only have to only you only have to do one only two things one area name like your meeting room meeting room toilet then you have to select your equipment name over here then what load type is this then what consumption quantity here you get all the details total load in what and total loading below so I think you must have some clarity on this topic how to calculate a electrical load if you have some query or any suggestion do let me know in the comment section below so that I will go through and I can revert to you on that so for that for that training of right now bye bye see you next"

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"VideoID": "360",

"Title": "Electrical hazards and safety",

"URL": "https://www.youtube.com/watch?v=oDBqZOOIFno",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Music] transformers raise the voltage of the electricity generators produce to make transmission more efficient and effective since so many homes and businesses need power the transmission lines can carry very high voltages on Long Island transmission voltages are typically at 69 thousand or 138 thousand volts that's enough to seriously injure or kill anything that comes into contact with a downed line and provides a path to ground a path to ground refers to a connection that allows electricity to travel down the wire to the ground lightning is a good example of high voltages seeking a path to ground by using charge molecules in the air to release electric energy into the earth people's bodies are made of about 65 percent water and water can be a great conductor of electricity if electric wires are so dangerous it's how birds land on birds can land on a wire because they're only touching the wire and nothing else so they're not creating a path for electricity to reach the ground if the squirrel tried to climb on to the same wire while touching a tree he'd get a nasty shock [Music] [Music] [Music] [Music] [Applause] [Music] [Music] [Music] [Music] Oh [Music] [Music] [Applause] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] everywhere [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Applause] [Applause] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music]"

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"VideoID": "363",

"Title": "Carpentry and Renovation Techniques and Technician programs and Electrical Techniques programs",

"URL": "https://www.youtube.com/watch?v=hAPCx0Ilsak",

"Keyword": "Electrical construction techniques",

"Transcript": "um hello um i'll introduce myself i'm annette dearling manchester i'm one of the full-time faculty in the carpentry and renovation program and i'm also the program coordinator with me today is craig brown who's also one of our full-time faculty and i'll let tim introduce himself uh my name is tim buns i um teaching the one-year electrical techniques program and i'm also the coordinator for that program and also the coordinator for the electrical trades apprenticeship so we run the apprenticeship on day blocks and we also have the apprenticeship for the night school and uh i have daryl pooley here with me he teaches strictly into the trades part end of it so i'm teaching in the post-secondary and then heroes into the trades end of it yes uh daryl pulley electrical apprenticeship here uh the block term so it's the eight week 10 week blocks that come into niagara college uh ito i teach solely into that program not into the post-secondary but i can speak to the post-secondary programs and how they relate to the actual electrical apprenticeship and the uh the journey within i've had the possibility uh and the pleasure of working with out in the field some of the electrical techniques program post-secondary students and i also uh teach some that uh have pursued theological apprenticeship beyond post-secondary um so i've i can speak on both ends on that one there so okay i guess i'm up on this slide here so i'm going to talk about our one year into your carpentry and renovation programs i'm going to start with the one-year certificate program it's called carpentry and renovation techniques and it is a really great introductory program to the world of carpentry and renovations so it is a very broad kind of program that introduces you to a lot of activities that you might run across in the industry as well as learning all about the tools and how to use them we are heavily focused on health and safety in that first year to make sure that you go into industry very safe and we have um lots of other courses most of the delivery in that first year program is very hands-on which i think most of you will find very exciting we do have some also in-class courses to fill in with the basics in things like math and estimating and blueprint reading which isn't there but that's another one of those essential skills that you'll learn in the first year it's um a great time to come into the construction industry there's a huge demand for skilled trade people because there's a chronic shortage if you've probably heard of and in fact we can't produce enough graduates because there's so many places at the moment so it's a great time to be coming into this industry so this is as i said a one-year program and um but it is common with uh the first this first year is common with our two-year program as well so at the end of this first year if you um want to leave and go on into the industry that's great you leave with a certificate if you're interested in learning more about this industry before you leave you can go over into our two-year program uh next slide please and um it's very easy to do that we make it very easy at niagara college to slip into this two-year program um all of what you've done in the first year counts towards um going into the second year and the great thing about going into the second year is there's a co-op position in the middle and that will take me to this two-year program again uh same name carpentry renovation but it's called the techniques technician program sorry technician program and that's the two-year program that has a co-op in the middle and after this two years of our program you're more than well equipped to enter the industry and probably able to some of our graduates actually start their own businesses when they leave not all of them but some of them do and also you've had experience in the industry from your co-op so you're that much farther ahead when you're finished um so a little bit about co-op because um if some of you are in high school it's a little bit different than what you do in high school the co-op placement is actually a full four months of paid work with um an industry partner we have a fabulous co-op department that recruits and finds placements and helps you get those jobs they help you with your resume and things like that you're also welcome to find your own co-op job a lot of our students do that but it's not necessary because we have a lot of co-op listings and so you'll um won't have to worry about finding that co-op job at least not at the moment because there's so many uh postings and of course the great thing about having a co-op term in the middle is um you gain all that experience in the industry and you might actually discover things that you like or things that you don't like by going out and working for four months it also gives you time to save up a little money for the second year which is great and um um also quite often once you've had a co-op position um it may work into a full-time job it sort of gets your foot in the door and um that is one of the advantages of doing the two-year program again as with the one-year program the two-year program we have lots of jobs out there so there's a high demand for our graduates we typically have about 100 placement when our graduates leave at the moment and um in the second year we go a little bit more into detail with the renovation portion of construction so a little bit more about project management the delivery of a renovation project and things like that again as i said it is um the advantage of having the co-op placement in that second year this slide just gives you sort of an idea of some of the courses you'll be taking in our program on the left hand side is all of the things you take in that first common first year i did mention some of them you'll get to spend most of your time in the labs at working with your hands you're going to get dirty working with concrete you're going to be doing some framing there are some there's a course on foundations different kinds of foundations and how to put them together exterior finishes trim [Music] again some of those really essential skills like blueprint reading technical math is important estimating you do have a surveying course if that interests you and basically a really good foundation for moving into the industry on the right hand side are some of the things that we get into in the second year we take things a little further in particular which is interesting we do a course in commercial construction because not everybody's going to work in the residential field so if you're interested in commercial construction which would be steel steel frame and drywall kind of construction then you'll have a good basis for that there are there's a course in mechanical getting you familiar with heating cooling electrical plumbing things like that we do have a green building course which is of course very relevant at the moment um so introduce you to some of the newer ways of building and um uh building codes of course is covered in both years but in second year we go into it in a little more detail and there's a couple of design courses actually that you probably won't find at other colleges in this program but we're um uh proud to actually include these because it makes you a more rounded individual when you leave that you can actually think about a project as opposed to just um following it through following instructions you're actually thinking about how it's designed and how it's put together so i think i'll hand this over to craig to give you a little tour of our facility uh quickly annette and craig um this is a great question that speaks i think to nc's focus on experiential learning somebody's asked how much time in the shops and labs do students actually spend on the program you know a breakdown versus in-class learning uh over hands-on learning or actually practical application uh that's a good question actually because it's hard to answer at the moment because we're in this um covid requirement so um a lot of our in-class um sessions aren't in class at the moment they're online but having said that in a normal world i would probably uh estimate that um 70 of your time is in the shop and maybe 30s in classrooms but it's difficult to put an exact number on it but definitely it's more in shock time than it is in classroom time craig would you agree with me i would say yeah it seems to be seems to be loosely broken down to um three per week would be a three hour lab and a one hour lecture essentially so right now those lectures are online um but hopefully we'll move into in person soon sooner than later yeah thanks a net thanks for that uh summary of the one and two year course good afternoon everybody welcome my name is craig brown i am a professor in the carpentry and renovation technician program and i'm lucky enough to give you a virtual tour of our shop unfortunately you can't do it in person at the moment but uh we're working on that soon so sign up for that um really cool place to to walk around so we're going to look at um let's focus on the picture in the top right hand corner so the entire space or the entire shop is called uh it's formerly known as tc177 and it's split into two spaces there's a and b so what we're looking at in these two pictures is a so this is kind of um the a space in the top right hand corner is where we kind of do our smaller our smaller projects mortising hidden hinges things we need a desktop for but all of those desktops are movable we get them out of the way when we have larger scale projects one of them one of which we'll look at in a few slides so that's one of the workspaces that's typically where we do our first 10-15 minutes of overview and theory before we get into the practical you'll notice behind them in the back is a some base that's where we work on drywall finishing hanging interior doors those sorts of things and above on top of those bays we've got our upper mezzanine and you can see the start of our commercial construction practices where we work with steel studding drop ceilings those sorts of things but that's the um half of the a space let's call it if you look at the bottom left-hand corner picture this is the other half of the a space all the same room this is where we kind of get into the larger scale projects and learning um in this space we work on the kind of the full residential gamut we start with uh commercial and residential concrete forming there's uh you can see a set of forms in the bottom left-hand corner of the bottom left-hand corner picture in those orange cages are what we call dura forms and that's kind of the industry standard for using doing concrete foundations you'll get a full a full lesson on that and full training uh that we look at residential framing of floors walls roofs how they're structured how they're built and we move on to exterior finishes roofing siding waterproofing and kind of finish up with interior finishes so trim work drywall mud and tape all those sorts of things so all those things happen in that in that open space in one form uh or another so it's a it's a it's a well-equipped space it's very very well uh taken care of by marco our shop tech he does a a fantastic job in this entire space and that is tc177a that's where you spend most of your time next slide please so bottom right hand corner uh picture so we're standing with our back to the space that we just looked at and we're looking into what's considered tc177b so this is a fully functioning fully equipped wood shop cabinet shop um very very well equipped uh an amazing space here uh the courses we work with in here uh have a lot to do with one of one of the courses it's a great example it's called tools and techniques so it's kind of a project based course we do some really interesting woodworking projects and that's how we learn about all kind of the cabinet shop tools the table saws the jointers the planers the overhead sanders we do we learn those tools and techniques through projects which makes it interesting and applicable you spend a lot of time on those tools and it's a great course it's a great space very clean dry breathable space you'll notice a really capable dust collection system hanging down from the ceiling very very overbuilt so it's a it's just a really comfortable space for learning and woodworking and the picture on the top left is one of the tool cribs you can see how really well equipped the space is every tool you could need many of them very rarely are as anyone waiting for tools so that's the other half of the shop if you wouldn't mind we actually have a quick question and i think there's a nice table before we jump over um a students asked what kind of lab equipments materials are the students provided with to work with as opposed to something they'd be expected to furnish so they have kind of all the the hand tools needed so they'll they'll supply without knowing exactly it's like a tool belt tape measure speed square knife ppe all of those sorts of things essentially i think the only thing they need they need to purchase is a hammer at some point they don't have to purchase one they can bring one from home we usually we don't supply a hammer to start because it depends on what you're interested in and focused on uh will determine what sort of hammer really you should you should get but generally everything you need to get started from a hand tool perspective is included and provided awesome thank you so much sure so this is just another shot of that upper mezzanine in the uh a space 177 a uh this is just a look at the commercial construction portion that's kind of further along from our previous picture you can see they've done extensive steel studding just really interesting i love that course knock down door installs lots of anything you find in a commercial or storefront space drop ceilings curved walls and and some drywall applications that work with with those formats and here's a here's a roofing trend you'll see a lot of these so these are used throughout all the terms both first and second year and one the first and through fifth terms we these are used for learning how to build and frame and cut roof rafters we use it in our structural modifications course where the dormer that you see sticking out of the roof um is added so we edit the existing roof restructure it you learn how to how to read loads and where the loads go and how to support them in creating that dormer we use it in exterior finishes including waterproofing siding flashing the applying the shingles themselves and so these roofing trainers are just a great example of how we really scale down the industry scale it down to to be applicable in the college space but it's the same materials it's the same movements it's the same orders of application that you'll find in the industry just kind of scaled down to a college size size lesson so you'll be very familiar with these the most excited for me is uh this is our small house project so this is kind of a fifth term focused kind of second year although most terms get to have something to do with our project this small house we're not calling it a full-size house we're not calling it a tiny house either but this is a modular build so it's split right down the middle so it comes apart in two pieces and that's for transport and this started its life in the shop in that a space where all those desks were and once we had the exterior finishes applied we moved it outside and continue to work on it now really interesting project uh we've done a number of really cool projects in the past like we've done a full-size modular homes that were delivered to traditional foundations and families are living in today we've done a couple of shipping container homes actually you can see one in the in the uh left-hand side of that picture just above that pylon there's one of the shipping container homes that we worked on and this is kind of the latest iteration of that program so these projects are great for kind of pulling together everything that students have learned over the all five terms uh including what they're learning at the time of this project course to really pull it all together uh the framing the finishing uh the mechanical aspects of things in an all framed kind of a general contractor framework or text so that they really get to hone the skills and ask the questions before they get out into the industry and again just just a really good project to kind of let them loose and let them work on what they what they've learned to date and uh and uh just really applicable to that to all of those previous courses and a lot of fun exciting and more interesting projects to come so career opportunities i can speak to this all all sections uh of the construction industry are booming i'm personally only three months removed from the from the day-to-day uh industry and i can confirm that employers are just eagerly looking for motivated interested people that uh that have a really well-rounded skill set and knowledge and uh yeah just just no shortage of opportunities out there very recently i was i was personally trying to find help trying to find trades trying to find um people to work with me on a general contracting basis and building homes and that's i can speak to how difficult it is so lots of opportunities out there i'm not going to list them all off but there they are and um they're right through the entire industry whether whether it's through if you're looking for employment or self-employment the opportunities are endless so before i just sign up i just want to say the best of luck to everybody and i hope to see around the shop very soon come and do a live tour with me i'd be happy to take you around and show you around but next up i'd just like to introduce [Music] an all-star student currently in his fifth term pedro and uh yeah so he's uh one of the students working on our fifth term and uh was in that picture of the small house doing some plumbing so um he's doing a great job and would like to for him to shed some light on that and and talk to you as well pedro welcome thanks thank you great thank you annette good afternoon everybody it's actually an honor to be here because i work where all of you guys are right now and i can directly answer you guys that everything you hear every video you see posted all truth and more than that i came i'm in the last term right now so i i can i can really like feel confident to say what i'm i'm saying right now and right now i didn't even graduate i'm one month away from graduation and i already have three job offers uh from january so three different companies i'm already working at kernwood homes as a part-time stream carpenter and i did my co-op at amber stairs one amazing company and they they want me to start there in january as well so it's a great market right now and about the college is one thing that i notice already when you are in the job site and you're in oh i'm taking carpentry at niagara college is the level of respect that people look at you and say okay these guys know something he's having a great experience and they treat you immediately with more respect and more confident as well so this is awesome and it's true because you get in the in the job site and you literally know everything that's happening around you don't feel like oh what's what's going on no you know you know everything that's going on so it's very good to for like for me that i'm like changing career so i'm i was completely new two years ago when i started and i feel very confident right now and talking about uh another thing that i really need to highlight here is the effort that the teacher puts to keep you like learning and they are always worried to know that if the experience is going well for you and if you're actually feeling confident to do it things and they give you things you do that's it's like awesome so i can't recommend more uh people that want to become a carpentry that this course this course is like a game changer and it is for me and i'm i'm so grateful that i did this choice that i can recommend more for you guys so if you have the opportunity and if you really want to to become a carpenter uh you are in the correct place and this supportive teachers that we have the program is very well crafted because it shows us different aspects and open our minds you think that we at first was not even uh think that was possible and it's happening right now so that's it i'm very happy and i'm very confident about my future right now and i i i have to say thank you to this institution to niagara college to annette to craig to call into every teacher that i have there that i'm i'm i'm so lucky that i made this choice thank you very much before we jump over to electrical i just want to thank uh pedro uh specifically for being here today as we go through the q a please remember you have an actual student who's directly in the program so if you want to ask questions about you know what was what was his knowledge base coming in where where has he been able to get help how are profs able to take him through each step safely or how is he building a skill set what is it he may be leaning towards now what does he think he wants to do career-wise or did he have something come in that he was kind of set on or has that changed think about these big kinds of questions we have an actual student for you to talk to today that's really in the program right now living it i'd love to see in that q a and especially as we get closer to the end think about some critical thing because it's pretty rare to actually get to talk to somebody doing it yeah okay um i can start on it from here we are a one-year post-secondary program um to get into the apprenticeship part of it what daryl will talk about here in a few minutes is that you have to be assigned to a contract uh to a contractor so you have to be working for a licensed registered electrical contractor to get into the apprenticeship part of it um the one-year program that we have here the electrical techniques program it prepares you um with the skill sets so that these contractors will hire you to get into those programs or get into the apprenticeship part of it uh our electrical techniques program most of our students um in september that come in uh we take in that's our majority of the students that we take in at that time and most of those students there are post-secondary students they're just coming out of high school a lot of those students have never used any tools whatsoever screwdrivers or drills or any of that kind of stuff and that's and that's definitely not a problem because we do start right from the beginning um and we teach all the students how to use the drills and all the hand tools and everything that's needed we start right from the basics um and within a few weeks of being in there for some of the students that's never even seen some of this equipment and that um they join right in and they don't have any problems whatsoever uh picking it up picking up the the tools and going at it again like i said we start off very very slow at the beginning and teach all the tools that they need teach how to use all these tools and then we'll get into some of our workstations in there and then it all started off very simple circuit of a single pole switch and then we went to a three-way four-way and we'll just keep building up on those circuits so our first um term that we have the 14 week term that we have is all residential uh application um again like i said in the shop class they get three hours in the shop class and they get one hour of lecture for that class um and again like i said we just build really slow up on the circuits and we just continue to add a little bit more and add a little bit more now a little bit more and then by the end they're doing a kind of a kitchen renovation wiring up for your kitchen counter receptacles your stove receptacles and then they get into renovating a bathroom so that they're putting a bathroom fan in and wearing up lights over top of a vanity gfi receptacles all that kind of stuff so it builds up pretty quick so this picture here is of one of the students this is actually the term is a term two uh thing so this is the getting into um week 15 um sorry week eight to 15 this one here's a a reversing switch so we get into a little bit of motor control so once we get into the second term in the shop class itself in the installations class we start out with some ac 90 which is just a flexible type of cable then they get into bending some emt which is uh electrometallic tubing um we work with quite a bit with that because the industry and that's one of the conduits and raceways that is very used throughout all the industries right from light commercial into some heavier industrial applications we get into emt so we do a lot of that um kind of stuff and then we work our way through um just some emt labs then we do some motor control some lighting control for all that into that part of the um installations class but also in level two and there we also work with uh instrumentation so the instrumentation we use um we get into some um plc control uh we get into some temperature and lighting uh controls all that kind of stuff also into the uh instrumentation part of it so our our program yeah it is on the the um well in campus we do have a uh two areas that we mostly work in uh the tc176s which is our shop class which we do all our installation classes in there but also in the electrical techniques program too we also do teach blueprint reading they call it drafting but blueprint reading we get you to a couple projects where you're actually teaching you how to read the prints what things mean on the print but not only in the electrical prints we also get into the architectural prints that you understand um some of the structure and how things are put together and why they're put together like that and some of the stuff that we can and cannot touch as far as greg or uh craig would tell you that uh you know we get a little uh aggressive as electricians drilling into some of the stuff that maybe we shouldn't but um on site so we teach those things but we can't and cannot be touched um also they in in our drafting class we get you to do a material takeoff so that you know what materials that you're going to need so if your boss in the morning hands you a set of blueprints and says this is the job you're going to be doing today you can take a quick peek at those blueprints before you leave the shop and you know what materials that you can that you're going to need for the day to complete some of those tasks that have to be done at that time so um being able to understand those uh blueprints and know the material that you need to um for the days is is a big thing running around for material for um that you forgot during the day is not very um not very good for time to get things done and also on those prints too not only doing a material takeoff that you make a list of materials we also talk about some of the things that um time that it takes to do certain applications like putting a service on a building um wiring up a certain area how long does this take and we kind of put some numbers to it so that if you want to become an entrepreneur down the road you have a good idea how the estimating is done we talk about contract documents we talk about putting in proposals and that kind of thing so through the drafting you get it both levels uh year one and and or sorry term one and term two um term one again is all residential applications and then when we get into term two then you're getting into your commercial applications for that also we have um electronics and electrical concepts our electrical concepts is our our basic theory so in term one we're basically working with dc voltages and dc currents and then in term two we get to talk about some ac voltage and ac currents and you'll build some circuits so you'll get one hour a lecture with your concepts one and two you'll get one hour lecture for that and then you get two hours in a lab class actually building these circuits and testing these circuits um and then we have the electronics is it starts off pretty similar to the concept classes and after a couple weeks it breaks off and it gets into more some more electronic components and that kind of thing and then again you got one hour a lecture and uh two hours in the shop or in the lab class building them and testing the circuits that you put together the the faculty the faculty that work with you in these labs and classes they're all certified master electricians 20 years plus of experience in the in the field so they they really know what they're talking about when they're explaining uh procedures how to put things together and how to get things done uh the experience that they have is is um amazing to what we have and what's amazing i think for niagara college is that we have staff that worked in all the different areas not only just the residential and the commercial and industrial applications uh we had some of the staff that's worked with the wineries uh they worked in the industry with uh agricultural stuff so your greenhouses and that kind of thing too so we have a vast of knowledge with with the the staff that we have that um that you're going to learn from and again when you come in don't be afraid to ask the questions they'll answer all the questions you want and i know uh most of our staff is is pretty proud and pretty happy with the accomplishments they made over the time that they worked in the field so they they have a lot of stories for you and examples on on different uh applications that they've done the demand for our students is is high i know um we do get a few of the students coming in that are in other electrical programs or they're in uh or they've taken the um construction renovation program where they want to know a little bit more about um the electrical applications so they come in and take this course for that um so we do have a few students that that not necessarily want to be electrician but they want that knowledge because they're getting into other fields like the construction renovations welcome to niagara college my name is tim bunz i'm the coordinator for the electrical trades and the electrical techniques program uh here at niagara college the electrical techniques program is done in a way that we can get the students to gain some skills to become get into the electrical trade the electrical trade though also has a bunch of avenues so um in the electrical techniques program here we touch on a lot of things so not only do we we touch on doing some residential wiring some commercial wiring we also touch on some fire alarm systems data cabling job estimating you know for students that maybe down the road want to be entrepreneurs for themselves so we teach a little bit of that estimating blueprint reading the electrical techniques program also is a one year certificate program so there's two terms of uh 14 weeks and the first the first term is basically all residential wiring so we learned some circuits in residential wiring the three-way switch four-way switches some lighting bathroom renovations kitchen renovations so we we stay in the first term fairly heavy into the residential applications and then when we get into term two which is the the the following 14 weeks we get into some more of the commercial uh wiring so we get into some ac 90 flexible armored cable conduit motor control and that's where we get into a little bit of the fire alarms and the instrumentation so in this room here we'll do our electronic theory our electrical theory concepts one our electrical electronic concepts and our instrumentation the concepts one starts off with some dc theory on some breadboards with some series circuits and then parallel circuits and series parallel circuits they work through that and all the math mathematical formulas with the electrical they'll go through all that in here they'll design their circuits and they'll test them all out and then they'll go on to other circuits and they just keep building from a small circuit and just work their way up and it just helps them to understand when they do get into the electrical field how um electricity works and and um and gives them a good understanding of what's expected them into in the field in the future we're in uh another one of our labs here at niagara college uh this lab here we use for our installations program so our installations one and installations too so installations one is the the level one again we stick pretty much completely with with residential on the level one so again this is where we get into wiring up our uh single pole switches three-way switches uh our kitchen renovations bathroom renovations labs so we go through pretty much anything that a electrician or apprentice would would run into doing electrical wiring for residential applications getting into level two we get into doing some armor cable ac 90 emt conduit bending we do some threading for uh rigid conduit work a little bit with pvc conduit bending and working with that so it's a pretty good diversity on on the stuff that we do that gives our students the skills that they need to gain employment with a electrical contractor so this is one of our lab uh workstations that we have here at niagara college on one side of the booth here we use our regular wood studs the students are able to drill the studs they mount their boxes run all their wiring for their circuits for a single lick against for their single pole and three-way switches in here and then in their kitchen design and all that kind of stuff is done on this side so they actually run we actually wire everything up wire up our single pole or three-way switch they connect it into the panel and then when they're done and everything is done then we actually test it we actually test everything live here so the students can see that it works and and it's kind of a gratification when the when the students can turn their circuits on or work their switches and everything seems to work the way it's supposed to we do here are very very strong on our health and safety so our students one of the biggest things they have to do when they're working on a panel they have to do their lock out tag out and test procedures so they'll use a multimeter and they'll test that out and they'll go into the panel to make sure the the panel is shut off they'll go in and they'll test it with their meters and when they're done they lock it out it's very very important that we teach that kind of stuff here so that when they get out on the job site and they start working that they know the safety procedures they need to to follow to keep themselves safe so we teach all that especially in level one we get right into the health and safety and in the safety part of doing electrical work again they wire everything up and then we test it live then when we get into level two then level two we get into the armored cable so then we can fasten our boxes onto our steel studs with our armored cable so our ac 90 or bx cable and then they will they'll do their circuits on the steel studs gives them a little bit of uh um real application kind of thing for on the job sites when they will run into steel studs and and mount boxes on that also in the level two we have uh in the installations part of it we do the fire alarm systems so we teach them the fire alarm systems they actually wire it all up they run it in they put all their their devices on here their smoke detectors heat detectors uh pull stations all that stuff and then they they actually program the panel and they set it all up and they do a walk-through test on this fire alarm system and then a little bit further into to level two then we get into our motor control and we teach them a little bit of motor control um we get into our stop starts forward and reversing um some time delay starting and that kind of thing so we get a little bit of motor control into it we have the fire alarm systems and the steel studs so they get into more of the commercial end in the level two here i have a couple of the trainer boards that was designed here at niagara college some of the staff here seen a need to have something that was directly designed for our electrical techniques program here we have a just a small training board that helps us with motor control with our stop starts for and reversing for our motor control it's just part of one more part of the the level two uh installations classes also in the level two we also teach data cabling so we get into cat5 cat6 some fiber optic cables we do a little bit of soldering in there for them for their fiber optic boards and testing them the data cable is is it just another offshoot that electricians might get into we've had some students that were very successful we're going out and gaining employment with some of the data cabling companies in the area and they they like our students for the fact that they can actually bend some conduit and and help them pull in some of the data cabling so that it's just one more um offshoot of being electrician or working in the electrical field is the data cabling so we do teach them how to put the ends on how to how to put it all together and test some data cabling thank you for taking the virtual tour here at niagara college and i hope to see you soon and to enjoy our programs and get some skill sets that you need to gain employment and electrical trade career opportunities in the electrical techniques program uh we do cover a lot of stuff we start again residential the commercial some of the industrial stuff uh we also teach some data cabling with uh fiber optic cables that's another avenue again that comes out of the electrical field um we do with fire alarms and security systems uh another uh industry that's got a high demand especially the fire alarm technicians of fire alarm area they're always uh looking for for people to work in that industry too it's a it's a but again with the the learning and the skill sets you get from the electrical techniques program with a lot of uh emt conduit bending we also do a fire alarm panel so you're able to wire up all those fire alarm panels test all your devices pull stations and smoke and heat detectors so you're working with all that and then we do have a lot of motor control so single phase and three-phase motor control that you learn some of that applications for them um we also work with some plc so you get to program uh some of the smaller smart relay plc kind of things and then we got some bigger ones in there that plc's that take a little bit more programming you build your circuits on a laptop computer plug it into the to the plc and run it through on one of the slider screens there you see previously there you've seen some stop lights up through the shop and the students can write a program or taught how to write a program for those street lights and then they can run them and run their applications and see how they work they can actually see um how the how they function when they when they wire them up there you go they're all yours all right i'll jump in i'll make this uh short and sweet just running through this just saying that the post-secondary program just it is not an apprenticeship right so i can speak solely uh because i teach in the electrical apprenticeship program i teach all different courses for all three levels whether it is the uh you're into night release um or a block term which is your eight week ten week box for your uh three terms for your apprenticeship so uh here at niagara college we do offer the industrial electrician apprenticeship as well as the next slide here is which is mainly focused on the uh construction and maintenance which is your 309a something that we all are and have you know worked with out in the field even myself being open and working in the field for over 20 years and then ultimately coming into teaching part-time and then full-time here at niagara college so i can speak on on the end of you know the anyone who attends the electrical techniques program coming from a employer so whether i'm the uh you know the site supervisor uh project management uh or the owner of my business working with uh students that already have all of this knowledge ahead of time coming out into the program um like coming out of the program and then coming into the field it helps us uh basically save a fair bit of time for you to already know all the basics uh you know you get into your canadian logical code with rules and regulations um basic circuitry your installations as tim said here conduit bending like all these little things will help you out in the field because ultimately you would have to be signed on by an electrical contractor um and then you would be sent in to do your terms right so whether you did a 442 which is your industrial uh electrician or construction and maintenance which is your 309a both offered at the college here um but i'll tell you right now again even besides working with the uh with the students that come out of a program like this out in the field um i'm i have the the opportunity now of actually seeing a fair number of them sift into the actual electrical apprenticeship program and this is where you'd come in and see faculty like myself and what i've noticed is that when they even prior to out in the field but now that they've come into the electrical apprenticeship program having this knowledge ahead of time and the basics and then i get to elaborate on it in class his his uh has proven success for students in in the ultimate outcome of completing their apprenticeship and writing their cfq and becoming a journey person and then either working for somebody or being an entrepreneur and running their own uh running their own business um working hand in hand with with uh with these students whether out on the tools uh which i have done for many years being a local contractor here for over 20 years in the area uh and then now teaching uh at niagara college into the electrical apprenticeship program you know for uh going into my fifth year now here um it's it's been an absolute uh you know pleasure to uh to work with some of the students that have come out of a program like this it really really really helps so program highlights again this is stuff that would be really really uh would be covered in great depth when you get uh out in the field but uh being an electrician having this i never had this opportunity in my in my life uh to do a program like this uh but luckily you know i ended up working in the trade itself but uh it's you know working in the electrical trade has been an absolute uh just an incredible experience i loved every single day i went to work i you know i liked getting up in the morning i never disliked my job um it was just a very very great opportunity it's a it's a great thing it's a great trade i'm telling you anything anything you do especially this one here working with your hands uh just absolutely absolutely incredible so uh so we have one last question here that i do see uh so mom's part of the paramedic program they're requiring work boots they're wondering if the same rule applies they have steel-toed work roots however they're not typical black or yellow is acceptable uh is anything else required for the course so i think this is more focused on materials what types of materials in terms of safety equipment would students be required to have i can answer i can answer some of that um into the electrical techniques program and i'm sure it's the same into the construction area the safety equipment that they need to supply for themselves especially with electrical techniques program is just a pair of safety boots they must have a green patch on them all the rest of the safety equipment we supply we supply your safety glasses in the electrical techniques program we also supply them with a lock and a tag because everything that they work on the disconnects and stuff have to be locked off and tagged out um as they work on it safety glasses are supplied uh we have for this covid right now we have special safety glasses with some rubber seals around them so a little bit more uh protective um but other than that that's for the safety equipment for us that's all they're required to make sure that they have their safety shoes and also one of the other things is that uh shorts are not allowed so in the summertime or in the time where it gets a little bit warmer out you're still not allowed to have shorts on in the shop classes themselves in your election classes and that is fine but when you're in the shop classes they have to have long pants on also as far as the tools go in electrical techniques program you are supplied with a tool belt which has your pliers and screwdrivers and all the equipment that you would need it's a nice little package for a first entry into into being electrician it's a nice little pouch to start off in our apprenticeship yeah the shops are air conditioned just to let uh some of your potential students know it's a little bit comfortable very important awesome well thank you guys so very much thank you for your time uh remember there are opportunities for tours to come up we will try to have you on campus if that's something that would help you uh with your decision making our faculty are great you can always reach out remember as part of recruitment we do have an opportunity to get those emails across to our faculty so if we can help if you have more questions between now and applying in february please never hesitate to reach out once again thank you to our amazing faculty and student and thank you all so much for being here really appreciate it and hopefully see you nc before too long have a great day everyone"

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"VideoID": "365",

"Title": "7 TIPS to Prepare for an Electrical Apprenticeship",

"URL": "https://www.youtube.com/watch?v=0ZsigMQWH20",

"Keyword": "Electrical construction techniques",

"Transcript": "things like subby sparky you are hungry so bring a solid lunch or bring a massive water bottle with you g'day legends welcome back to think list and today i'm gonna be sharing my seven tips on what i think you should know before starting your electrical apprenticeship now of course this could apply to any other apprenticeship as well there are specifics around electrical but if you're doing like your plumbing carpentry or anything like that i think you still will get some value now the catalyst for this video was actually somebody commenting on one of my react videos and it was cloudy here and he says i'm planning on doing my electrician trade through the army here across the ditch in nz what advice could you give well cloudy mate i am so pumped for you because i think being a tradesman is massively underrated and i think there is still a bit of a stigma around people that go into trades instead of going to university i mean the knowledge economy has got so many people wanting to sit on their butts instead of doing things all they want to do is you know do an events course or they want to do you know gaming or they want to do youtube so i'm going to try and distill all of my information and wisdom i've learned over the 15 years that i've been doing this into one video it's gonna be short but before i do that if you haven't watched my channel i am actually an electrician i react to things like electro boom and some other crazy dudes on the internet but i have been doing this for a long time like i said 15 years i started out my apprenticeship actually as a domestic electrician just with a one-man band i learned a lot from that guy and then i moved on to doing like domestic commercial big high-rise buildings other shop fit outs and things like that and then i moved on to fast-paced manufacturing industrial i did like shipping containers plastics molding food preparation all sorts of stuff and now i currently work at one of the biggest water boards within victoria doing large infrastructure big pumps and motors and things like that so i've got a broad knowledge on the electrical trade but we all have to start somewhere so i'm taking you right back to the seven things that i wish i knew before starting my apprenticeship let's do it so tip number one guys is that on time is late and i learned this one from my dad now my dad's like an old-school carpenter i'm pretty sure he was building boats with like noah or something but he told me that 20 minutes early is actually on time now an example of this would be my first tradesman that i worked with as an apprentice he was just a one-man band and he was going around people's houses he was doing rewires random jobs and then his start time on cider at their house would be 7 30. so that meant that i had to get to his house at around 6 30 if it was an hour's drive but actually i needed to be 20 minutes before that because he would get me to load things up in the car you know he would get me to do some paperwork look at where we're going back when we had mailways and not gps so it's really important to note that you don't want to be holding up your tradesmen from doing any work i mean we get a notoriously bad name for time already and that is because it's so so hard to predict a lot of time in advance like how long a job is going to take so don't make it hard for the tradesmen get there 20 minutes beforehand all right guys this is tip number two and it is to bring a solid lunch now i know this might sound a little bit stupid to some of you it depends on really where you work but this goes back to not being able to inhibit your tradesmen from doing what he needs to do throughout the day you may be just with a one-man band so you'll be next to him in the car a lot of the time you don't want him to be taking off some sort of random course to get you lunch or you don't want to be having to eat take away every day because you forgot your lunch or whatever so just make sure you're bringing a lunch and you're going to be doing a lot of physical work a lot of the time this may be a little bit different for you if you're coming from straight out of high school i remember thinking man this is a lot of work up and down ladders all day you are hungry so bring a solid lunch or bring a massive water bottle with you because you're gonna need it all right this is tip number three and it is to ask questions now i know this seems pretty obvious but i just want you to picture this right you're like 16 17 18 and then you're asking questions of this like really busy tradesman it could be massive it could be intimidating you know you're asking him to stop what he's doing is to give you time to ask you what you think might be some sort of trivial question but the fact is if you don't know what you're doing you could be a danger to yourself and everyone else around you so don't be embarrassed take some time ask the question and if your tradesman's not willing to give you the time it might actually be time for you to think well maybe i might need to move on to someone who's actually going to teach me because this is the time when you need to be learning so this is tip number four and that is understanding tradie talk so things like subby sparky um so these are words that you will either get called or you will likely use throughout your apprenticeship now it's just important to note that this is a culture thing so tradesmen just tend to use swear words a lot more on site and of course you don't have to do it but if you're being called some of these things you just need to understand that sometimes it's actually an endearing way and they're not really kind of abusing you or bullying you but of course you should know the difference between bullying and not so if you are getting bullying i would appre i would make sure you approach your tradesmen and of course um if you're having problems with your tradesmen your uh apprenticeship scheme if you've got one even go to your trade school or your parents or things like that so just note that there will be all sorts of different vernacular coming out of tradesman's mouth and it's not necessarily a bad thing all right this is tip number five and this is specifically for sparkies and that is to get your bible and no i don't mean like the bible i mean as3000 it's called the bible because essentially you'll be holding it close to your heart for four years you'll need to read this thing back to front being an electrician is half about doing the job and another half about understanding the theory and legislation as3000 within australia and new zealand actually is a legislated standard it's one of the only ones that can be called up within court and if you're not following it you can get into some really deep trouble so this is something that you will be taught throughout your trade but before you get started it's you should go and buy it purchase a hard copy i recommend and just read and understand like the chapters where are things like earthing where things like underground cable protection and things like things that you might be working on so just familiarize yourself with as3000 so this is tip number six and that is to get good tools so when i started my apprenticeship i got like this apprentice trade kit from wattmaster it had apparently everything that i needed i don't have one tool from that kit because it was crap i mean it was good value but honestly if you can afford it i would highly recommend getting some decent tools all right this is tip number seven and that is that safety is above all else now this is something that i've only recently really thought of in the latter part of my whole trade and it's only until you get to like you know your big industrial infrastructure companies that they have some really really heavy ohs policies and it's really really important that you can try and adopt these if you're not in these industries if you're in domestic try and understand that you should really be thinking about your safety first and foremost what you're doing is not worth losing your life over and not being able to see your family at the end of the day so just make sure that if you think that something is not safe you report it to your tradesmen or you report it to somebody else to make sure that you're not conducting unsafe work all right that is pretty much it for me i have got ton of different information that i could help you guys with if you want so just leave comments below if you enjoyed this video could you please subscribe and also like because it really really helps me out but otherwise if you're thinking about getting an apprenticeship i highly recommend doing it it can open so many doors you will get some of the most amazing experiences out there you get to do and learn at the same time so get out there and do it"

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"VideoID": "366",

"Title": "Why electricians should give props to the other trades #electricalcontractor #electrician",

"URL": "https://www.youtube.com/watch?v=WXrq7suaDko",

"Keyword": "Electrical construction techniques",

"Transcript": "hey electrical contractors on my job site here in Malibu again I know you've seen a series of these videos but that's where I'm at I'm in California in my brick and mortar I'll be back in Montana soon hey quick tip give the props to the other trades what do I mean by that anytime you see the general contractor any sign you see the owner tell them how awesome the other trades are now if they're totally not awesome I don't want you to lie but I want you to find something positive that the other trades are doing stuff that maybe help you or something you appreciate because you know what always pay it forward make the other guys look good and you will win in the end that's a quick tip for you guys that are coming up in the trade we'll see you on the next one hey by the way have you subscribed yet"

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"VideoID": "367",

"Title": "Electrical Pre-Apprenticeship Program",

"URL": "https://www.youtube.com/watch?v=hz8RShXd-X4",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Applause] I love an electrician because it offers so much diversity of work there's so many fields that you can go into that gives you different opportunities for learning and to me when you become a journey person you never stop learning you want to learn more and you get more experience in the field which makes you more employable [Music] the main difference between our program and other programs is focused it's intensive training and we focus on what's gonna make them successful contractors are the people for a table and to get those skills here [Music] electrician is a profession no less a professional and a doctor or a lawyer or a Dez's we offer in their premise five years you start making money the first year unlike other professionals you're not staring a long-term student loan you have no debt and you got a really good job and people that can complete this course [Music] know all those other things [Music] [Applause] I was really happy because when I got to go onto site I felt really comfortable and I wasn't worried about me a female in a male dominated worse [Applause] [Music]"

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"VideoID": "369",

"Title": "Bathroom Electrical Tips",

"URL": "https://www.youtube.com/watch?v=B0XyDf0o-Vw",

"Keyword": "Electrical construction techniques",

"Transcript": "All right. So electrical, it's really easy when you get all the walls\nremoved like this because obviously\nyou can run all the new wires and it's really important\nto investigate your existing electrical, especially if you have an older home\nand you've had many renovations done. Usually a lot of the stuff\nwasn't brought up to code or just was really sloppily done\nin this particular bathroom. We had some old knob in tube and that was\nreally dangerous to add new devices to, especially if you're doing something\nlike a new outlet or something like that. Hairdryers suck out a lot of amperage\nand you don't want to be using your old wiring for that. So we're going to go through step\nby step on what you want to do typically or what\nI typically do in a bathroom for a setup. So let's get started. Okay. So the common setup for electrical\nin a bathroom for me is the way I basically do it on\nevery job is I get a three switch box because I like to have my fan\non a separate circuit. Usually there is a light above the vanity\nor on the side sconces of the vanity. So we have a separate switch for that. And I always put a recess light\nabove a tub or a shower and then that be on it's\nseparate switch as well. So a three switch box,\ngang box is usually ideal for that. This particular situation,\nI have a fairly narrow bar, you know, depth in my wall\nbecause of the way the old structure was. Now we're going to have to add on a little bit of thickness here\nbecause my jam sticking out, but this little tiny frigging\nbox is only about three inches deep and that's going to work fine\nbecause right now we have an inch and three quarter\ngoing to add another half inch plus. The half inch drywall will be about three\nand a quarter inches. So normally\nI like to have the bigger volume cubic inch boxes\nthat have a little bit more depth. It makes it easier\nif you want to do a timer switch or if you wanted a a dimmer switch. Those things kind of take up a lot of\nvolume and it's kind of tough in this box. But in this particular situation, we're just doing straight switches,\nso it's not going to be a problem. All right. So then we're going to be running this up. Typically, you usually go off the floor\nabout 52 inches to the bottom of your box. You know, a lot of times\nI reference what the rest of the house is. So it's all the same. But typically it is between 5052 inches\nfor a switch box. Now you want to pay attention\nto not being too close to your trim. We're going to be getting\na four inch trim on here. So we don't want the switch box\nbeing too crowded in this situation. It looks like as long as I just go\nstraight up against my two by four here, I'll have about an inch and a half space\nbetween that and my cover. So just be aware of your circumstances\nin your own bathroom. The other thing is I'm going to be doing a tiled wainscoting,\nso I want to pay attention to that. I do not want this outlet\nbeing chopped off or half thing. You know, either it's going to be in the tile work\nor it's going to be all of the tile work. I think it's better just to be higher and be above\nthe tile work rather being in it. But that's all again,\njust press perfect, my personal preference and then basically\nhow high your wainscoting is going to be. My particular Wayne's clients, we've got 48 inches,\nso that 52 inches is going to give me plenty of space between the switch cover\nand that tile work. Okay, so I've got to cut my stud here\na little bit. Okay? Okay. All right. And then I need to put some plywood over top of this\nso that when we get our half inch drywall, we're even with our jam. So I'm going to put some half inch strips\non here and then and then install the box for about to have these little tabs on here. I just want to make sure\nthat they stick outside of the finish wall that you're installing. As good as you are,\nmake sure it stays level. Otherwise\nyou can't really adjust your switches in this direction. Okay. So for power supply to this, just a 15 amp line, 14 two is all that you need. So we're going to run this\nall the way down to our panel and this is going to be our power\nsupply to the switches. And I also have another switch\nfor my attic, for my lighting circuit. You can add the lighting circuits. You know,\nif you had an existing lighting circuit that was not knob and tube,\nyou can certainly use that. But I would definitely advise\ngetting a new 20, applying for your GFI and if you're doing it for heating. So when you take this out of the box, I would roll this out\nso that you're not twisting your wire. So just get enough\nto get all the way down to your location by just rolling this out. And this will keep it kind of straight\nwhen you're running it. So this particular situation, I'm going to be running it down\nthrough here. I have an open ceiling down below\nso I can just roll this through the floor joist. So let me get it sort of a nice little pathway and all of this stuff will staple and probably zip tied together here. But for right now,\nwe're going to keep running our wires as the nice, easy chase way to get down to the basement, staple these so that they don't get pinched\nin the drywall or anything. Okay, we don't need that much lift. We'll just keep this out for now. I have a joist right against the edge\nthere. That's going to be kind of difficult\nto run a wire through there because I have\nto drill up in and try to fish it down. So I'm going to go underneath the floor\nand bring my lighting circuit up. We're going to be doing\nmost likely two side sconces. So I'm going to bring my power or my power to the\nthe light fixtures underneath the floor and over. So we're going to work this vanity light. This is power. So just make sure I know that it's power. Okay? So this guy is just going to get tucked in front of the installation so that when we figure out\nexactly where we want that light fixture,\nwe can grab this wire and put it in place. So I'm just going to put a staple here, put the insulation and hold this out\nand I'll be able to grab it. Most likely it's\ngoing to be somewhere around five foot or maybe six foot,\nbut you'll be able to grab this wire. We want to bring one over\nfor the other side of the light to work. Fine for now. All right, so we need a light for above our tub. So this is the old B cable that they have attached\nto the knob and tube. And as you can see,\nI have open splices here. This stuff is really nasty. In some ways. This stuff is even worse\nthan I've been to. If you see this stuff, that's\nyou don't have no opportunity. This is rooted everywhere\nto replace this as well. This is really a lot of times\nthe sheathing can wear out around the edges here. And then when you're adding new light fixtures or something to this,\nyou can get a spark. You know,\nthis is just a dangerous type of wire. This stuff is probably,\nyou know, 60 years old as well. So definitely get rid of that. But obviously, open splices\nlike this is definitely not good. You can even see, you know, they just have a cloth\ntape around it, just ugly, ugly stuff. So definitely try to be safe and take this stuff out of here. So used to just fish all the lights throughout the house, probably done in probably done in the thirties,\nprobably twenties. So last a long time. Just we have\nwe have higher demands on our electric and you don't want to be connecting\nold or new devices to this basically. Sorry, sorry. So when you're drilling holes\nin the ceiling joist, try to be in the center,\nyou know, just try to keep it. So when you're putting your screws\nin, if you're drywall that you're not going to pinch that wire. Plus, I'm actually going to fir this down\na little bit with some one by material. So when I nail this,\nI want to make sure I don't nail my wires. So I'm going to go up a little bit\nhigher here. But you have to be aware of like\nthere's a floor above here, too. So people are nailing down and you really want to be,\nyou know, two inches away from the edge. So they don't puncture your new wires. So I like to center these in the shower area. So about three foot somewhere\nwithin this stud bay. And then we're going to be about 16\ninches to the center. So I just have to wrap this wire up again. I'm going to be drilling a hole\nand then grabbing this wire. So this is going to stay kind of loose up\nhere. This will be under the installation\nas well. I'll cut a hole in and be able to grab this wire. So this is all going to be\non the same circuit. So that's throughout this and we'll just keep this loose\nuntil we get our vent fan in. But this is a little odd here. I'm going to basically notch this out a little bit\nand put a metal plate on it. I mean, obviously,\nthis is a weird scenario where you have the the studs are flat. So I want to just notch out a little bit\nmore of this and then just put in a a nail plate to hold it together. You will make sure that this is loose. You don't want to that pinching anything. All right. And we'll bring this down is to be powered as well. I always just market with a magic marker. Okay. So these two get wired together. This is my vanity light. This is my fan. This is my light fixture. So I take about an inch off the sheathing. Okay, so what I like to use\nare these wego clips. These things are awesome. So you just. They're just like little levers. You just lift them up, stick the wire, and. Nope, sorry, wrong side. Stick the wire inside. And then you just want to make sure\nthat your copper is seen through the back side of the way you clip but that hold it\nin nice and it's really easy. I mean it's like, you know, you can't\neven if you screw up you can just lift that lever up\nand take it out of there. So really kind of a\nnice little system here put in this. So there you go. Nice. So then they come in all different sizes. So this is a five lever because what we need to do here is put all of the neutrals together. So all the white wires\nneed to come together. Okay? Again, just make sure that all\nthose copper lines are sticking up above. Pull on your wires,\nmake sure they're all connected. Well, and so the power leads are connected here. So all of this\nwe're going to have to get basically three separate power supplies\nto each one of these. We're going to do that\nafter we get everything else hooked up. Well, let's go ahead\nand just put all our ground together here that all these and then use a way to clip that will go to each ground to\nto each switch, point around each switch. But we're going to basically\ntidy it all together first and then let's just get this tucked back\ninto the back of the box. Okay. So we're going to put this on here\nfor our ground because we're going to have to connect\nall that eventually. Okay. Without in there for now. Okay. GFI Outlet, I really highly recommend these type\nof boxes, these adjustable boxes. This will make it really easy, especially\nif you're doing a tiled wainscoting or any type of wainscoting. You can adjust this to fit\nto where your wall meets. Now, as far as location goes,\nI don't personally like them directly behind the vanity area. I'll take them out kind of on the outside so that when you have your wires\nconnected, they kind of droop down. But, you know, below the vanity,\ntypically you usually your flat 42 inches\noff the floor for the bottom of your box. The only thing you want to pay attention\nto is what you're doing. I'm having a towel wainscoting. That's coming up 48 inches. So we're going to be about there\nand I'm going to have a little border. So we're going to have Bolanos\na little border. And I really don't\nwant this outlet in that border. So I want to keep this down\na little bit further. This is also where it's nice not being in\nright directly behind the vanity. It's nice to have it to be able to have the flexibility\nto make it a little bit lower. And it won't, you know, in a period\nwith the actual countertop. So we're going to be actually\ninstalling a 30 inch vanity. So our vanity is basically going to be\nending at the edge of this two by four. So just paying attention to that,\nyou know, the countertop is not going to over\nhang out for. So I'm not worried about it. I'm going to just keep this down\njust to be safe because I don't know how wide of a border\nI'm going to be doing it, but if it's four inches, I want to make sure\nthat I have plenty of room. So I'm going to actually bring this down. So in this instance, we're gonna be\nlike 36 inches at the bottom of that box. So this would be a problem\nif you were trying to, you know, if you had a countertop coming all the way\nover, 36 inches is way too low. Typically\nthat's where your countertop sits. But since this is outside of that vanity\narea, it's not going to be a big deal. I would be kind of basically in line\nwith that countertop for the most part. So I'm going to go ahead and use this box. Now, this is designed to go over\nlike a regular two by four. So it has these little nailing\nflange pieces on here. I have to cut these off now because I'm putting them on a flat two\nby four like this. So just cut that off. I also don't want to be too\ntoo close to the wall either, because we're obviously going to have a tile\nwainscoting coming here. And I don't want to have it\ndirectly in the corner. So we're about four inches\naway from the wall, which will work out great, will basically\nhave about two and a half inches of space between the edge of the wall,\nbut yeah, these are great. So you can just basically bring these\nout as much as you need to make them work. All right. So then for your GFI, you\ndefinitely want to be using a 28 of wire, so 12 to yellow cable. So we're going to run this straight\ndown to the basement. This will be completely dedicated. That's what you want to have for GFI. When you're using hairdryers and things,\nyou definitely need it to be dedicated. VOICEOVER It's not bad. It's very bad. She's out here."

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"VideoID": "371",

"Title": "7 AMAZING Electrical Hidden Secrets You Should Know! Tips &amp; Tricks",

"URL": "https://www.youtube.com/watch?v=TFAlTj2KtiQ",

"Keyword": "Electrical construction techniques",

"Transcript": "on this episode I'm going to be showing you seven tips and tricks on electrical that you should know so I highly suggest you stay tuned [Music] welcome to fix this house if you're new to the channel consider pressing the Subscribe notification Bell so you can always be in tune on DIYs how-to videos and product reviews that I do within this channel so let's go to tip and trick number one that you should know my very first tip and trick for your friends is have you ever looked into a receptacle or electrical outlet just like what you see here and you ever notice on this ears right here there's two little different size kind of like Mickey Mouse ears at the very end and if you look into this Loop right here you see that it says strip number 12 wire and you see right here it says strip number 14 wire let's just say you don't have a wire stripper in hand if you can just use that strip gauge at the back and you can just insert that thing on the back right there Circle all the way around like so it acts as a wire stripper you can just go and see that I just stripped it on there it's a pretty cool built-in feature that these Outlets have so so when you get a chance go take a look at one of your outlets and take a look at these I know the printing is super small you kind of need a magnifying glass but that's what they are made for so that's a pretty good tip and trick to know especially if you're a beginner in electrical work so tip and trick number two you might find this very very useful have you ever wondered what these little arches right there onto this Outlets are at first you might think that these are pretty much kind of like a stopper when you're putting in wire or something like that let's just say you don't have needle nose pliers or you don't have this wire stripper where you can make these Shepherd hooks I use these wall claws sometimes to make these little Shepherd Hooks and you don't have them to twist like this like that well the purpose of these is to help you make those Shepherd hooks so let's get a bare wire take a look at this it's pretty amazing you insert it through right there and it actually helps you make a shepherd's hook like so that easy so hit a thumbs up if you think that was pretty amazing so okay next one if you ever tried installing electrical switches you always try to wonder am I installing this upside down or right side up or is it backwards I don't know but anyways the thing that you can tell if it's upside down is just make sure that the manufacturer label is reading just like that so if you see that it's reading properly like made in the USA it's not upside down then that's how pretty much how you do it but another thing that's very very good to know is that if you're accidentally put this upside down the on label like I say will say no no so if you see no you're definitely installing upside down so put it back up and there you have it it'll be on so no means no on correct so friends if you're finding this video super helpful so far please kindly hit that like button so this video can be spread out and shared more to other people so they can better helped on these tips and tricks on electrical with that being said let's get back to the video so personally this method I do not recommend I know there's a lot of videos of there showing this method I don't like it because it's just a knot and after that knot is placed they pretty much go like this and they go put a sleeve or a shrink wrap over it and that's it the problem with this method is once electricity starts passing through here it goes on a hot cold hot cold it repeats that process hot cold hot cold and it becomes an expense and it contracts and over time this knot right here pretty much get loose and could possibly create an arc in there could possibly start a fire this is just not a reliable way to do it there's a lot of videos going around showing this method I don't recommend it the one I do recommend is the alignments place or the Western Union supplies which I'll show you right now lime and splice or the Western Union splice is a lot more reliable and it's very easy all you have to do is strip your stranded wire just like so and you're just going to cross it like this one goes clockwise the other one goes counterclockwise and you're just gonna feed it right through about three to four circles around so that's one two three and you're just gonna do the same thing on the other end given this is just an example but if you are going to do this on a closed wiring system you are going to put a sleeve first or a shrink wrap sleeve over there and then you're just going to close it off just like that okay so just make sure that there is no frayed wires sticking out make sure everything is nice and closed off and that's not it what you I highly suggest that you solder your connection soldering is the 100 Proof to do it I'm just going to do a quick recap on how to solder I'm not going to do a detailed video here so stay tuned for that video and I'm going to show you how to solder wire the detailed way so stay tuned for that video but in recap you're going to do this Western Union splice and once that's done you're going to put flux over it you're going to solder with the 60 40 and once that's done we're going to put the silicone paste over for waterproofing then you slide that sleeve and then we can go and shrink wrap that but overall that is the correct way to do it that is the the best and professional way to do it rather than using that that hack where you go and do that tie knot and then you put that shrink crap over so this method is definitely the best way to go if you have any questions on that leave it in the comment section down below I'll be glad and more happy to answer that question but overall that is another tip and trick that I want to show you friends another tip and trick and I'm really excited to show you this are using these taikon solder and seal wire connectors I'm not sponsored by any of these products I show in this video I bought this list with my own money what it is is it's all these connectors right here that comes in different sizes let me show you how this works I opened up one of the wires so that the frays are wide open like that just a little bit not too much because if you do it too much then you won't fit it through the tube got one of these tubes for you see the solder in the middle and there's that tight tightening ring on each end slide this through just make sure that all the strands go inside the tube like that you're going to do the same thing on the other side so notice how notice how all the wires just kind of just connect right there and you want to meet those connections right in the middle just like that and it goes the wires are goes goes like this so now that the insulation passes the blue ring on both sides now we can use the heat gun and melt that solder to fully have a connection okay so it sucks so so you're gonna start seeing it start shrinking pretty cool watching this just kind of hug The Wire and you're gonna see the solder melt right before your eyes and see that silver solder is starting to go and spread right between all the crevices of the wiring so there you have it now you have the sleeve fully surrounded the insulation right there nice and hugged and now you have those Rings right on each side wrapped around the insulation again for another waterproof connection like there and notice how the solder inside just melted and embedded itself inside those wires in between those wiring connections just like that and if you're unsure then if you want an extra protection you can actually roll on another shrink wrap sleeve to cover this whole thing so you can have double insulation purposes so you don't have this exposed but this one's I do this wiring all the time and I'm pretty satisfied with this but it's up to you if you want to put another shrink wrap tubing over it just to make it aesthetically pleasing but overall you can see that the connection is definitely connected right there make sure it's nice and cool and the harder I'm I'm really I'm really really pulling on this with really really hard and it's not coming apart so again friends this is like my number one that I like doing it's quick easy you don't have to take out the 60 40 solder you don't have to take out your soldering iron all that equipment it's just easy Plug and Play heat it up and it's connected so again this kit comes in all types of sizes for each one and how many quantities and they're called ticon they're 150 pieces soldering and seal wire connectors if you're interested on this I'll leave the link on the description down below and all the other tools I use in this video I'll leave the link on the description if you want to go and try and try this out for yourselves I know you're probably familiar with this I do this all the time with my electrical instead of using wire nuts which I'm not against this is another method that you can do connecting with wire nuts but faster way to do this is using waygo 221s these are push and levers these are fairly easy to use very DIY friendly highly recommended they're just leversed that open up like that push this in make sure it is connected at the back it's all the way connected and seated all the way up no wire showing close the lever and then do the same thing on the other end close it and there you have it you have a quick connection another alternative rather than using wire nuts each one of these have its own place so again I'm not ruling which one is better than the other it's just yeah each one is your preferred but I highly like using the Wago 221s they do come in different sizes two three even five so again if you're interested on getting these I'll leave the link on the description down below not sponsored by way goes I just like to you know share this tip with you alright friends we're coming down to the home stretch now I want to show you my last final tips and tricks I know we struggle sometimes on trying to find wires that are clumped up inside of the jbox electrical box and you just don't know where the wire or certain wires are running through your walls I got a solution for you and that's using wire tracers now this wire Tracer right here is by client tools let me show you how to use it let's try to do your best to group up all the K the wires to other respective cables you can see the sleeve where they're actually going to that's even perfect now you know where they're actually grouped up and that's half of the battle attach it to the bare wire okay so I'm just going to attach it right there and then attach it right there and do now is just turn on the device so once it says continuity and it's green then you're ready to go and it actually defaults to 800 Hertz but you can scroll around there and pick one whichever tone that you want but we're just gonna stick with the default you can control the volume levels go and try out that light fixture first and see if that's the one that's that connected to so we do have a faint sound and turn up the volume let's go test out this miscellaneous spot right here again still raspy to this one gang right there it's solid so if you look at the bottom of the probe there's a positive and a negative red clip always goes to the positive the red is connected to the white so the white has to go to the positive side of the probe black is connected to the black just to make it easier we're going to connect that to the negative Port the to the positive and then we're going to hook up the black to the negative you don't even have to turn on the probe this probe is actually off so there you have it friends those are the seven tips and tricks that I want to show you as of now I got more coming so stay tuned but let me know in the comment section down below which one you found super helpful which one you like which one have you tried and let me know also down below if you have any other tips and tricks that you want to share with the community down below kind of leave that in the comments and again if you're interested on any products that I use within this video I'll leave the link on the description down below so check out those links so once again I'm Jay from fix this house thank you so much for watching I'll see you in the next one foreign [Music]"

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"VideoID": "375",

"Title": "Electrical &amp; plumbing work in construction of house | civil engineer videos tamil",

"URL": "https://www.youtube.com/watch?v=yY9xDsL9Td0",

"Keyword": "Electrical construction techniques",

"Transcript": "hello friends welcome to civil engineering videos channel my last video on the brickwork problems and the thank you friends"

},

{

"VideoID": "382",

"Title": "Important Tips for Electrical Home Wiring While Building Home | UltraTech Cement #BaatGharKi",

"URL": "https://www.youtube.com/watch?v=RuLBKTC82ik",

"Keyword": "Electrical construction techniques",

"Transcript": "electrical outlets such as switchboards and sockets should be planned during house construction only if the quality of switches falls short or their placement is wrong then the interiors may look odd and new outlets add to the cost keep in mind each room's layout and consider the placements of furniture fans and air conditioners along with heating circuit lines install only high capacity switches in the kitchen and the living room also install one or two extra sockets and bedrooms and bathrooms old sockets and switches should be isi marked do not forget to do their earthing to prevent any risk of shock or malfunction in the electrical connections install electrical outlets outside of your house as well which might be required during maintenance or gardening [Music] stay tuned with us at bharat gharki from ultratech [Music]"

},

{

"VideoID": "384",

"Title": "Bending Electrical Conduit Don&#39;t Miss These Tips for Professional Results!",

"URL": "https://www.youtube.com/watch?v=p7sKhGZaBsc",

"Keyword": "Electrical construction techniques",

"Transcript": "now put 582 send you in a 3/4 but nobody's been right position it here okay there's your ride you need 5/8 is that like an app it's awesome right so we only need to come up so we do a 15-degree where's our fender bender had shipper a different scale so you got a 10 degree 20 degree and 30 degree 45 and 60 degree ends okay if we did a let's just say we did a 10 degree Bend okay then after hour after hour tailpiece let's just say we lit with a six a six inch tail piece right then we would do three and five eight it's a space in between so that's nine s-58 all right okay so these are our two points this is three five eight o'clock so then what we do is and we're using the ten degrees then how you bastard so you line it up at the out on your first mark all right okay okay and it was great when you bend down to 10 degree okay see that it now we're down to 10 degrees we spin it around it's just for a quick waltz at Oh quick ball set set should be 5/8 in three and a quarter so we're going to go a two and a quarter so I'm happy hold up like that lemon I just hold it component but cold a rate up right go to the exit can we market all the way around let me know when straight through on a percent rate he has me look video it's good way to go go a little bit to the wall good good how's that good good yep we gotta push we got push here and then I'll watch your fingers da usual"

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{

"VideoID": "386",

"Title": "Electrical Hoist Wiring Diagram / Crane wiring / Overhead crane @CircuitInfo",

"URL": "https://www.youtube.com/watch?v=0KFKIY0SLaA",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] hi welcome to circuit info YouTube channel in this video we can learn Electrical hoist wiring diagram please like And subscribe to my channel and click the Bell icon to get new video updates [Music] he [Music] he [Music] [Music] a he [Music] [Applause] [Music]"

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{

"VideoID": "388",

"Title": "How to fix bowed shiplap 💪 #construction #tipsandtricks #shorts #builder #tips #skills #shiplap",

"URL": "https://www.youtube.com/watch?v=bPJBt9BAyZ0",

"Keyword": "Electrical construction techniques",

"Transcript": "here's how to fix a board that you just can't pull down with your hands and it's not lined up where it should be so first what I did was is I cut this piece of wood to be about a half inch longer than the Gap is supposed to be above this other piece of shiplap stuck it in there and hit it with my hammer a bunch of times to pull it down using that as my leverage point after I got that lined up as good as I possibly thought I could get I then came back and nailed it with my trim gun I threw in a bunch more Nails than you see here but it turned out perfect"

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{

"VideoID": "390",

"Title": "Electrical Power Generation Transmission Distribution System",

"URL": "https://www.youtube.com/watch?v=gGN6HPo9TnA",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] so [Music] so [Music] [Music] so [Music] [Music] [Music] so [Music] [Music] you"

},

{

"VideoID": "395",

"Title": "How to start and grow your electrical contracting business in 2023! All my tips and tricks.",

"URL": "https://www.youtube.com/watch?v=O4r-IcT-39I",

"Keyword": "Electrical construction techniques",

"Transcript": "hey welcome back 360 electricians welcome back to the 360 electrician podcast I'm your host if we haven't met what's up my name is Jeff the 360 electrician hey I started this podcast because I want to help electricians become electrical contractors and electrical contractors to level up their business and be successful I want to teach some of the things that I've learned and especially try to make you avoid the mistakes that I've made so in this video let's get right into it we are going to talk about how you're going to make your business grow in 2023 now I'm going to talk about a couple topics that you've heard of and I get it but I'm going to try to expand it especially if it's a term that's used in the industry for like marketing okay marketing every business uses it but I am going to tailor it down to marketing for electricians right if we talk about uh anything like digital marketing or digital stuff we're gonna break it down to how how I just pointed to my field pulse shirt how we're going to tie it in to electricians and electrical contractors okay so follow along and let's get right into it if you want to see the video version of this podcast you know you can head over to YouTube and just type in in the search bar the at symbol the 360 electrician podcast and of course our main Channel which is just at the 360 electrician so first and foremost I'm just going to kind of bullet through some of the items that I think I want to talk about today and I think that you need to hear about some of them you're going to hear again like I said for the second third fourth time I'm going to try to make it easy I'm gonna try to make it bite-sized for you because a lot of the subscribers to this podcast and channel you're in your mid to late 30s and if that's you I'm talking to you this is why I'm making this video now of course it applies if you're younger and you're older it applies if you just started your trade uh Contracting uh business or if you've been doing it for 20 years and you need a refresher it counts especially if you're thinking about being a contractor in the next year or two so what's the number one number two number three number four number five way that you're gonna grow your business well first and foremost don't forget I do sell marketing courses and paperwork courses so you're going to hear a lot about that and those are all available on my website www.the360electrician.com so officially this podcast is probably sponsored by myself but we will be talking about some other sponsors of the channel but not this video particularly and how they're going to benefit you as well so let's get right into it so you're going to hear some stuff that you've already heard before but I hopefully will refresh your memories and probably put a little bit of an electrical electrician twist into it so grab a pen and paper and if you want to watch the live video of this uh it's also going to be put on YouTube on our YouTube channel www.the360 electrician podcast right on YouTube and also you can get links to this podcast on our on our regular website www.the360electrician.com and of course Spotify Apple and Google podcast so if you're coming in from those I welcome you I hope you sure I hope you do subscribe so the first thing you're going to do if you're going to try to grow your business in 2023 is you're going to have to start networking now networking is easy and it's hard in the same fashion the easy part is you can join a networking group and the way you can do that is you can go to Google and type in networking group for Cincinnati Ohio networking group for Fresno California I don't care where you're coming in from Dallas Texas you're going to find an order organization that actually does networking groups now how those usually work is you're going to pay a small fee sometimes it's 30 a month sometimes it's an annual membership and they kind of require you to go to the meetings right and when you go to the meetings you're going to be in a room of 10 people eight people 20 people whenever the group allows they usually limit it to a certain size and you will most likely be the only electrical contractor in that room but here's the cool part across from you is sending a real estate agent maybe a broker a general contractor HVAC plumber hair stylist the point of this is that the deal is you scratch my back and I scratch yours right you start you make an exclusive pact you're only going to recommend that plumber to everybody you go to and that plumber is going to recommend you as the only electrician and you guys are going to help each other's business grow it's probably one of the easiest networking groups and ways you can get in and start spreading the word now I don't think I've ever mentioned this on any of the YouTube channels or my or my podcasts but that truly is a simple way in a very low cost way to gain clients okay and exposure for that matter so if you're just starting out that's what it's made for it's made for you to Market and grow you also as I said need to seek out other professionals that are close to your trade but not exactly okay for example maybe a construction lawyer right maybe there's lawyers in your area that deal with construction law and maybe you can approach them and say hey Mark John Julie whatever their name is I'm just getting started I don't have legal representation but if I ever need it I would like to know that I can come to you for help absolutely Jeff of course I'd love to help you etc etc and then maybe you can throw in there and say hey and by the way if you have any projects that have gone South and they need to get repaired or you need any expert advice I would be willing to help you out as well until the time comes where I need you it's a great way to network right so I've got plenty of plenty of different ways that you can Network networking to me is not just just word of mouth but it does have a lot to do with it you go to the gas station don't fill your gas at the pump walk into the gas station anybody that you can have a conversation with while you're wearing your logo right anybody who can have a conversation with you can just say hey wow that weather today or any kind of Icebreaker even the person that's taking your money and just saying yup it's crazy yeah I'm an electrician I got to go to you know this and this and do a pre-project today and by the way if you need an electrician here's my card give me a call or if you refer anybody to me let them know that you sent me and I'll come back down here and I'll give you 20 bucks or I'll give you an incentive or whatever the case may be that's just another way to Market when you go to your kids school or when you're at an event or anywhere you are you have to wear your logo shirts and your items you know I preach that your logo needs to know in two seconds anybody needs to know that your logo is an electrical logo it's got to have a light bulb an electrical bolt a plug I need to know and two seconds flat when I look at your logo that you are an electrician it's super super important okay find new business opportunities by networking I think it's a great way to go all right the second thing you can do to grow your business is to start getting and think about this you've got your license in electrical I'm assuming or you're going to get it in the state that you're in okay another tip for me to grow your business is now get your other certifications and what do I mean by that if you're going to do EV electric car chargers and you want to stick to a couple of brands or you want to be a supplier of those Brands call those Brands up and say do you guys have a certification do you guys have a vendor something that makes me official uh you know there's courses when we do gate motors that if we take those courses on safety we get a certification from the quote unquote industry a big one is solar right you need you can get qualified you can get your certificate and be a certified National electrical solar installer those things are going to help you grow your business why several ways it's going to beat the competition when you show up at a house and you say hey I'm a certified installer of solar versus I'm just licensed to do solar okay I'm licensed and certified by a nationwide industry organization gate motors hey that guy can do your gate motor but I guarantee you he's not even licensed and he doesn't have any certifications here's our credentials it builds trust it's the way you're going to grow your business especially when you hit those property management companies to try to get work right guys what's the biggest way you can do that bombard them with awesome information that's useful to them not to you your Certificate of Insurance you're this your liability insurance all that good stuff referrals and your certifications I can work on your apartment's gate motor I'm certified to do that okay then that is a big plus big win and it it allows you to up your dollar your tickets a little bit more because now you know there's a there's a value for that client to pay you a little bit more yeah that guy's about a hundred dollars cheaper but this guy is certified warrantied licensed the whole shebang I think I'm gonna go for him I hope that helps you know that's a big way that you can do it what's another way you're going to grow your company in 2023 guys well it's not sponsored this video is not sponsored by them but the channel is that's a field pulse fieldpulse.com I have links below if you're watching on YouTube I'll try to put them up on all the Spotify and everywhere but if you sign up with field pulse you're gonna get a 20 discount on your monthly membership and a 30 if you sign up for the whole year now why am I talking about field pulse guys it's 2023 you have to have service software I don't care if you're a one-man show or a 20-man show you've got to run your business somehow are you gonna only stick to paperwork you can you have to have paperwork I sell my paperwork course you want my paperwork with all my terms and conditions email marketing all that stuff go to the website and pick that up at www.the360electrician.com however I take my paperwork content cut and paste it also into the digital format on field pulse okay and now what is does that do technology is going to help me grow my business in several ways fieldpulse is going to have the marketing included you're going to be able to Market and send emails out to your clients you're going to have those lists ready to go if you put tags in the software so for example if I do gate motors and I do a swing gate motor or a rolling gate motor I can narrow it down and put a tag for gate motor I can narrow the tag to a rolling gate motor and I can narrow the tag to the brand of that gate motor okay you can do the same thing for Ev charger solar um gosh what else anything and everything equipment wise you install why because let's just say that that company might have a recall squared e you remember that recall and if you had put squarity qo and maybe residential commercial or whatever and there was a problem and you want to now go back to those clients that you did five years ago and Square D is going to pay you to do it I'm sure right we don't know what happened with that whole ordeal didn't become as big of a problem I guess as most that's a whole other podcast but now you can click in your field pulse software squarity qo hit a button everybody's gonna pop up that purchase that from you and guess what you're going to do you're gonna start cold calling them and saying hey Mr and Mrs customer do you remember me I'm Jeff the 360 electrician we installed that panel for you three years ago well I'm sorry to say it but Square D has got a recall blah blah blah let's just say residential clients you put a tag in your field software that says residential clients and now you're sitting around like I am doing a podcast because you're not busy on the field I'm just kidding of course but you're not busy you're in the office you say boy I sure wish I was working right now oh here's an idea Jeff just gave me on the podcast let me go into my field software and type in residential customers hit that button you get their names you get their address you get their email address then you make an email that says oh it's almost spring what happens spring forward and fall back you change smoke detector batteries what Jeff what are you talking about heck yeah you want to call those clients and email them and say hey we have a special if you did it within a year it's under warranty or something like that but hey we have a special we're changing smoke detector batteries uh four for the price of three 199 we're gonna come out we're gonna change it we're gonna put a lithium ion Energizer battery we're going to test it and if you need need a replacement fifty percent off I don't know I just threw that out there you guys but you see how I can find that client through my software super easy right what if a new product came out for commercial maybe it's some kind of a really cool sensor for something I don't know what you put commercial and maybe you put another tag in there for restaurant and then you can sell product as it comes out so I hope that helped you've got to embrace technology okay I've got a lot of different ways that I run my business I use Google admin the back end Google I pay for it and that way I have the docs and I have the the Google Drive and all that good stuff how about this one ready for this you ready for a poor man's uh what is it contractor cam is that the new one that's been coming out contractor cam if you're listening uh maybe you should reach out and sponsor the channel not a bad software I did a test run on it the other day but I do mine for free technically with Google Google photos how do I embrace technology with Google photos if you have three-man crew you're gonna make an email address that's going to be let's just say email at your company name right and then you're gonna have a separate password for me I do Tech for example Tech at the 360electrician.com I don't have that so don't email me that but that's what I would do and then every single one of my technicians would put that onto their shop phone because I do supply shop phones every time they take a picture of the job site like company cam every time they do a video of the before the after and the during it all gets uploaded to Google photos and guess what and since everybody's using the same account all the pictures drop in to the same account where I can go on my end look it up cut and paste it into my field software so again a property management company I go out there and I see that the panel is burnt I take the cover I take three pictures of it and then I do the job because I got the approval as I'm doing the job when the box is out I might take one or two pictures for reference when I'm done with the job I take one or two after it's nicely labeled and then guess what when I invoice the customer I send them before and after all through my service software hey what do you think about that if you're watching on YouTube hit subscribe hit that like button if you're watching on any of the podcast uh Apple Google or Spotify subscribe hit that subscribe download support the channel because this is the kind of information I'm gonna give you ready for another tip let's go all right my next tip is the diversification which I keep preaching to you yes you gotta diversify the offerings that you're doing okay if you're just a residential electrician you better start thinking about Light commercial if you do both of those you better start thinking about solar in 2023 right fluke is all in on solar did you guys know that if you don't you will on the channel coming up soon you need to start doing gate motors you need to start doing EV Chargers you got to start diversifying diversifying but not only your offering are you ready you gotta diversify your team yes did you think about that for a second when you hire hire people that do other things besides just residential electrician or this or that if they've got painting experience if they've got low voltage experience if they've got the solar experience if they used to be a programmer and they got it skills I don't care what it is when you hire and you've got candidates try to pick the most diverse candidate you can they don't have to be the best electrician in the world right they could get trained but I would rather get someone that's good at a lot of things because there's common sense that comes along with it you really need to build a strong skilled team in different areas than just electrical I hope you can understand how important that is because as the demands of your business change you're going to have the right team members right there to attack it and when you start doing new business someone that maybe has learned or or done solar is better at certain jobs because maybe they you know they've learned different ways to do it low voltage is a great great entry point you guys I make a ton of money in my brick and mortar when I do low voltage I offer that to clients after I've signed the proposal the contract to do the main work and then I go in and go I need to talk to your low voltage contractor to see where they want the outlets or their fire sprinkler contractor right and they sit there and go excuse me you mean you're not doing it nope not in my contract I did the course at the 360electrician.com that Jeff had and in it it told me about exclusions and one of those exclusions are low voltage did I tell you I'm sponsoring my own channel on my own uh program today all right are you ready for tip number four or five where are we at I'm not sure but let's go to the next tip all right our next tip is to keep up to date with industry standards keep up to date with what's going on in your Market keep up to date with new things coming out and try to be the front runner of those things and what do I mean look solar Edge for example everybody used to make solar inverters right and then I went to the electric trade show in Vegas probably about six years ago and boom solarage came out with a inverter that also has an EV charger built into it whoa Game Changer right imagine if you were the first guy to offer that and your competition didn't know about it and so when you go to offer something and they're offering a different inverter brand you can say I offer this inverter brand and by the way I'm going to throw in a electric car charger that's tied into the inverter Works off your solar panels boom amazing right that gate motor technology I told you about there's always new Innovations coming out there's always new devices like ring doorbells there's always new alarm systems that are DIY but you can install it right a lot of clients they buy these things but they don't know how to install it how about Lutron my one of my favorite Brands Lutron right they just updated the cressetta system which is a not a poor man's uh automation by any means uh it's it's but it's an entry point and why don't you offer cressetta from Lutron and when you're doing that kitchen remodel or that small remodel why not say and if you sign up with me I've got a special going on right now if you sign today I'm going to give you a 500 home automation package you know what that's going to cost you 200 out of your pocket right but the value is 500 600 800. now they can have their Alexa control all their devices and they can have timers and stuff like that you're not going to know these things if you're not up to date with the industry and what's going on in in the industry itself with new products now here on YouTube I get the benefit of doing that well YouTube and this podcast because people reach out to me with new products because they want to push it and sell it that's what I want to do to you I always want to educate you guys on the really cool stuff that's coming out so that you guys can also sell it so by being up to date with industry development and what's coming out you could be the front runner and definitely offer more see this all ties into offering more stuff in your business as well correct yes it does all right I want to wrap this podcast up with probably my final uh suggestion to you if you really want to grow your business some of you got to click off at this point because you've followed me for a long long time and a lot of you have already done it you've bought my marketing course on my website www.the360electrician.com my marketing course is a game changer for the electrical contracting industry nobody nobody nobody that I know of of sells anything like it I am going to teach you how I grew my business 16 years ago within the first two to three years I never paid a penny to Yelp Google or any other advertising for retail work ever why do I say retail because I did spend a little bit of money uh in a subcontractor group to get new construction jobs and stuff like that totally different story but as far as retail door-to-door Angie's List all that Yelp stuff never did you guys know that for months and months and months I've been saying guys I've been around 16 years and I only have 15 5 star ratings on Google did you know I looked the other day and my brick and mortar in 16 years only has five five star ratings why I don't pay for leads I am the lead number two I don't base my business in the stars I don't look up in the sky and wish upon a star that my business is gonna take off if I can just get more clients and kiss their rears they'll give me another star and that star will turn into another star heck to the no I make each and every client so happy give them so much value and rip up hundred dollar bills and give them the half to pass out to their friends and family and when they do I bring the other half and I put it together I'm being uh what's the uh I'm using an analogy I don't literally rip up 100 bills but that's what I teach you in the marketing course and then I teach you how you get your Flyers passed out for free Without You lifting a finger or paying anybody else to do it and everything I'm telling you is print ready you tell me what you want on your flyer based on what I have you pick one two three I want fan motor generator solar Eevee car charger I want a 25 coupon or I'd I suggest now to everybody's a 50 coupon and then I put it all together for you and then I send it over to you and you just take it to the printer I'm gonna send you your your hundred dollar bills right I'm gonna send those to you ready to go so you can start making one customer to three three into nine nine and 27. you guys have heard that almost on every single podcast every single live but if you're listening right now I'm not just going to preach it I'm going to tell it to you right now right now I don't know how long it's going to be there so if you've heard this maybe six months from now I'm sorry I don't know if it'll be around but right now if you go to the website www.the3cc electrician.com and purchase the marketing course or the paperwork course for that matter that's a whole other subject I told you about the paperwork course it's ready to go sample of my electrical contracts paperwork terms and conditions to protect you from all the legal mumbo jumbo take it to your accountant your lawyer and your state for certification to make it legit to where you are but it's all editable you get 50 off if you type in in capitals take t-a-k-e and the letter F and the number five zero uh take 50. I'm gonna put it on the screen if you're watching on YouTube head over and do that guys I hope you enjoyed this podcast this is the kind of stuff that I'm gonna be bringing I hope my content gets better and better for you guys in 2023 that's my goal uh sponsor the channel if you're on YouTube hit that super thanks if you got something out of it and support the channel did you guys see the video we're starting to give away stuff on the streets anytime that a sponsor gives me anything if I get more than one these sponsors thank you Ranger design I don't know if you guys know about Ranger design the best system that you can put into your cargo vans I'm gonna give um away partially on the street and partially on the channel here on YouTube and on the podcast so that's it for now let's start 2023 the right way and let's start making the money that we deserve to make it's not about the money it's also about time I want you to have the time and the freedom to do what you want to do with your life just like I've been blessed and I get to do it here we will see you guys on the next one"

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"VideoID": "400",

"Title": "Who invented table fan? #electrical #arduino #arduinoproject #electrical #construction #kakinada",

"URL": "https://www.youtube.com/watch?v=QV94gJKxlhI",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign"

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{

"VideoID": "402",

"Title": "Top 10 Construction Tips &amp; Hacks That Work Extremely Well",

"URL": "https://www.youtube.com/watch?v=m\_zstkqs0F4",

"Keyword": "Electrical construction techniques",

"Transcript": "have you ever thought about how professionals make Building look so easy and quick what if you could get better at what you do and make your projects even better the top 10 construction hacks and tips that really work and can save you time money and a lot of stress are shown in this video are you ready to improve your building skills with secret tips watch to find out how to use these game-changing strategies number 10 plan twice cut once when it comes to construction the classic proverb measured twice cut once is a fundamental principle yet it encompasses more than just measuring before you ever take up a tool is essential to have a proper plan in place whether you are constructing a little shed or a complete house is important to plan each and every stage of the process this include taking particular measurements compiling inventories of components and even attempting to anticipate probable difficulties when you plan your project with great care you lower the likelihood of making mistakes that could end up being very expensive you make certain that you have all the required resources on hand and you maintain the time frame for your project utilize digital tools such as computer AED design CAD software or apps that are focused on Project planning these can assist you in visualizing your project in three dimensions identifying potential problems and developing detailed blueprints number nine for further Precision make use of a chalk line a chalk line is an extraordinary instrument that can be utilized for the purpose of obtaining straight lines for the purpose of cutting or arranging things while framing tile installation and drywall installation are all areas in which is especially helpful you'll have a clear and exact guide for your work if if you simply stretch the chalk line across the area where you need a straight line snap it and you will have it in the event that you need to draw a line on a surface that chalk does not stick well to such as wet concrete you should make use of a laser level instead you will end up with a straight line without any mess if you do this number eight enhance the performance of your workbench configuration a workstation that is well organized can have a significant impact on the amount of work you get done make sure that the tools and materials that you use the most are easily accessible and think about purchasing ped boards or tool racks that are fixed on the wall so that everything is not only visible but also easily accessible in addition a movable workbench that is equipped with wheels can be a GameChanger because it enables you to relocate your workspace to a more convenient location so saving you both time and effort installing a power strip on the side of your workbench will allow you to easily reach electrical outlets which will eliminate the need for you to constantly look for a place to plug in your tools number seven make sure that your tools are always sharp the use of in effective tools not only slows down your job but also poses a potential risk it is important to sharpen your tools on a regular basis whether you are using saw blades drill bits or chisels this will ensure cleaner cuts and lessen the likelihood of slips or kit backs is possible to maintain the best possible condition of your instruments by either purchasing a highquality sharpener or taking them to a professional service on a regular basis you can make use of a file or even a piece of sandpaper to make any necessary adjustments to your blades or bits if you are in a bind and do not have access to a sharpener handy despite the fact that it is not as effective as sharpening the tool properly it can get you through the work number six make use of a magnet in order to locate screws and nails that are concealed when you're working with existing structures particularly when you are renovating them you will frequently need to locate nails or screws that are concealed in the walls floors or ceilings a powerful magnet can assist you in locating these items in a short amount of time without requiring you to tear open the structure it is sufficient to move the magnet around the surface in order for it to attract any metal objects that are concealed in order to assist you in reaching regions that are difficult to access or inconvenient you can attach the magnet to a string or the end of a stick number five dry fit before you fix always perform a dry fit before permanently attaching anything such tiles pipes or Lumber this is the case regardless of the material in order to ensure that everything is exactly aligned with one another this requires you to lay out all of your materials without using any adhesive or Fasteners taking this one easy step might help you avoid making mistakes that are expensive and ensuring that the Finish looks professional an important piece of advice is to take pictures of your dry fit so that you may return to them when it comes time to complete the installation this comes in very handy when dealing with intricate layouts such as tile patterns or piping systems number four When painting make use of gravity to your advantage utilizing gravity is a straightforward method that can expedit the painting process which can be a time-consuming Endeavor When painting walls begin at the top and work your way down to the Bott bottom additionally as you continue painting downward any drips or runs will organically merge into the background staining and applying sealant are two examples of other chores that can be accomplished using the same method always brush in the direction of the grain to avoid leaving brush marks and finish with a gentle even stroke to smooth out any ridges or streaks that may have been brought about by the brush number three painters tape can be used for more than just painting the painter's tape is a tool that has a wide range of applications in addition to its obvious application in the process of producing meat paint lines it can also be utilized to hold small pieces in place while you are working to mark off areas that require protection and even to name materials with the jigsa placing painters tape along the cutting line will help avoid splintering and give you a cleaner cut this is especially helpful in making delicate cuts when removing painters tape after painting is recommended to take it off at a 45° angle while the paint is still slightly wet this will ensure that the lines are as clear as possible number two it is recommended that you mix small batches of concrete by hand the use of a full-fledged concrete mixer is not required for modest projects such as the insulation of fence posts or The Mending of Pavements alternatively you can mix concrete by hand in small batches using a wheelbarrow shovel or even a large bucket this is an alternative method to begin pour water into the Container next add the dry mixture in a slow and steady stream while stirring constantly until you reach the desired consistency folding the concrete mixture over onto itself multiple times rather than stirring it is the best way to guarantee that it is Thoroughly mixed utilizing this procedure allows for a more uniform incorporation of the materials hence lowering the likelihood of weak spots appearing in the final product number one maintain a regular cleaning program in addition to being aesthetically pleasing a clean office is also beneficial in terms of safety and productivity cleaning up after yourself on a regular basis while you are working can help you avoid mishaps like stumbles and Falls as well as protect your tools from being misplaced or damed DED at the end of each work day establish a process in which you clean up any debris put away any instruments that are not being used and organize the resources you have if you want to keep your workspace clean without having to continuously replace the vacuum bags you should use a shop vacuum as a dust separator there's more to mastering the art of construction than simply employing raw force or putting in many hours of Labor instead of working harder is about working smarter you will be able to greatly enhance the quality of your work boost your efficiency and reduce the amount time and money that is involved in your projects if you incorporate these top 10 construction tips and hacks into your workflow the following tried and true tactics will assist you in achieving professional results with less stress and more satisfaction regardless of whether you are undertaking a significant construction project or simply conducting some doit yourself work over the weekend it is important to keep in mind that the sepret to success in the construction industry is not simply the tools you employ but also how you operate them consequently if you remember to put these suggestions into practice you'll be well on your way to becoming a more knowledgeable and effective Builder if you found these construction tips helpful and want to learn even more tricks to up your game make sure to subscribe and hit the notification Bell there's plenty more to discover in our upcoming videos"

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"VideoID": "408",

"Title": "FOOTINGS 2 FINISHED S3 Ep.3- Electrical Walk-Through New Construction",

"URL": "https://www.youtube.com/watch?v=JYCvnyaNzvY",

"Keyword": "Electrical construction techniques",

"Transcript": "when you're building new construction how do you decide where the electrical outlets go I'm Steph Saunders with key team at compass and on this week of footings to finished we're going to walk you through this week's electrical walkthrough we're in Lot 4 which is a Lincoln model and this week we had our electrical walkthrough with the builder as you can see theyve started dropping in electrical and we go throughout the whole house and you decide where you going to want your switches so for instance here's a box that we're putting in coming into the kitchen here's another one that's going to do all the kitchen lighting and then if you come over here you're going to have a switch for when you come in from the front door and then of course you need lights that will go here coming from the stairs they'll do the whole stairwell and your family room lights so we walk the entire home we figure out exactly where you're going to want things we also figure out with some of your overhead lighting are you going to want ceiling fans are you going to want chandeliers all of those decisions get made at the electrical walk through any of your plug Outlets those are all based on code so those get placed where they need to be what you get to pick is sort of everything else when you walk into this bedroom do you want your light switch on this wall or do you want it over here so those are more decisions that we make and as you can see we've started wiring everything in another thing we'll figure out is where where do you want your recessed lighting so here you have two that will be in this hallway oh we have a little bird that's in one of the houses so oh hi hi little guy hear you I'm going to open up this window and hopefully he can find his way out we don't want him stuck in here so while we do the electrical walk through here you're going to meet with our lighting vendor to pick all of your lights it's a lot of options so it's good to have a Pinter dress board to think about what you want for instance in your family room do you want a fan or do you want some kind of a chandelier do you want flush mount lights in the bedrooms or do you want ceiling fan lights and then of course there's all of your the lights over the island there's the lights outside your house by the door there's the lights that go over the garages it's a whole lot of options so it's really good to have a Pinterest board so you're not overwhelmed when you get into the lighting store if you're loving this new construction content then why not like subscribe share with a friend and don't forget to tune in next week for another episode of footings to finished I'm Steph Saunders with ke team at compass [Music]"

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"VideoID": "409",

"Title": "New Home Construction Electrical Walk-through Tonight on Footings 2 Finished",

"URL": "https://www.youtube.com/watch?v=E879G\_rxrVU",

"Keyword": "Electrical construction techniques",

"Transcript": "on this week's episode of footings to finish we're going to check in on Lot 4 and I'm going to show you around the electrical walkthrough and how you decide where your lights's going to go I'm step Saunders with key team at Compass join me Wednesdays at 700 p.m only on YouTube [Music]"

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"VideoID": "414",

"Title": "Home Electrical What you need to know now! installation electrique de batiment complet A-Z",

"URL": "https://www.youtube.com/watch?v=PXCFaaN4\_QM",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Applause] [Music] [Music] [Music] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Music] [Applause] [Music] [Applause] [Music] [Music] [Music] [Applause] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] we she to worry [Music] [Music] oh that [Music] [Music] [Music] [Music] [Music] [Music] [Music] day [Music] [Music] [Music] [Music] geillis [Music] [Music] [Music] [Music] [Music] [Applause] [Music] [Music] [Music] Oh [Music] [Applause] I'm [Applause] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Applause] [Music] [Music] [Music] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Music] [Music]"

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"VideoID": "415",

"Title": "Starting an electrical business, Top Tips, Working away",

"URL": "https://www.youtube.com/watch?v=NKPTnkh6VNQ",

"Keyword": "Electrical construction techniques",

"Transcript": "ah right ready what are we talking about today what is what's the topic so sorry I know you've not read any of the [ \_\_ ] pre-lip um Tim Bob has just started on his own so I'm gonna yeah well no but well we have in the drumstances yeah it's just a long process it's just I am on my own I'm not on my own mates so yeah we're gonna have a double about that do you mind to talk about where he came from where we all know you from yeah whatever I don't get out by anything it's obviously xnaggy so we'll briefly touch on that but not just dwell on it we want to move on but yeah talk about Tom or anything like that I just well just let's just say obviously it's working for him now you're on your own [ \_\_ ] like that because if he wants to come on he can he won't because you know he'll get upset because I ripped his his classic his Club his thingy video listen everyone's victim at some point I like him though I'm a fan he's the best YouTuber by far right ready let's do it hello and welcome we're back Monday club um electricians podcast Monday club um tonight we've got a special guest Jimbo the electrician yeah what's happening so Jimbo is if you for those of you who don't know used to work for Tom Naji the king of YouTube uh electrical YouTube and now um he has gone out on his own and we are going to talk about the trials and tribulations and setting up by yourself especially as a young lad um and like how it's been what it's been through any top tips and all the all the things to avoid so without further ado Jamie why are you sitting there with a dumb look on your face because you need to sponsor well I'll get to the sponsor in a minute I'm just say waiting I'm not sure the new Flowood of this new system under the new regime but I am here and I'm on time that's the most important thing well you're not so just so as everyone knows as always Jamie dodianas we are sponsored by Verso Verso do fuse boards sockets switches all the accessories you need to rewire house successfully now their fuse balls are awesome their Buzz bars are silver plated and and they've got a new small form factor afdds let's go and check them out uh in the show notes below um on audio and on YouTube go and check them out have a click on there and uh see what's good also head over to my install um at Verso electrical.co.uk and sign up for all the top tips and tricks coming out in the industry so far why but if I'm not mistaken we'll be cool because I think I think so I'm fitting on YouTube earlier there don't know I'll just turn up mate so today I thought I'd Rock a luminous yellow I was gonna say you look to be very nice you look like you was friends with you know what I mean all I'm saying is I feel like you're in a baby grow yeah yeah I know right what are the scores Sam's got all these big baby grow no Joe what I bought it in Primark the other day my Mrs hated it and I thought well when am I ever gonna wear that never written down so yeah so sorry for any visual viewers uh you have to look something like look look like my child honestly I've got some news actually news does Jimbo want to talk are we just going to talk guys I'm just going to do the news before we start Ed from the show from now on if you read professional electrician that counts as one hour CPD so I officially declare for all you listeners out there yeah if you listen to this [ \_\_ ] for one hour that's one hour CPD and if anyone says it's not time to come and see me so yeah first of all first of all definitely don't take an hour to read professional electrician three seconds yeah the middle page I can't confirm why or how that is the case but they have said that's the case so I'm saying if you listen to this this is CPD as far as I'm concerned now but I'll put this down a CPD on myself last time we mentioned professional electrician I've got a load of uh load of emails and messages from them coating me off and they found all of our they found anyone to do with the in to do with us and covering us off do you not think these are connected stuff I do not think this is connected to that so yeah um just by simply pick picking up a copy of electric professional electrician and have it on the dashboard of your van for the next six weeks you get one hour CPD and some gets one hour of aggro so yeah moving on well whatever news is there uh what was that um the electrician's podcast is back if you don't like swearing so I just thought I'd let everyone know that I had a chance to listen yeah and uh Jay the spark we mentioned last week is going to come on because I mentioned it might be saying electricians we're electricians podcasts you mean the electricians show the electrician show it's amazing and they'll name that so similar isn't it it's almost like it on purpose and then released this show on a Monday for Fox sake Neil anyway nah listen it's all good um a lot of love for them a lot um they do what they do they do it different to us and that's important because you don't want two of the same show do you no you want everyone to listen to that and then realize oh God they've got it here what was the other bit of news a little bit of feedback I mentioned James last week stop swearing I'm about to cover that I'm about to cover that I mentioned spot but last week Oh blank me when asked him on he's actually gonna agree to come on now so that's good brilliant feedback wise do it in the comments you seems to do it in the comments and yeah still in the comments I would just try one without swearing right and I was gonna I'm generally gonna cover this now in a serious matter yeah this is me this isn't an act this is what I'm like I don't think you'll manage it to do it so sorry no we appreciate your feedback and we generally do appreciate your feedback and that's why I'm mentioning it a lot of the time I try not to but then I get into a flow and I can't I can't help myself I don't I try not to drop big things but every episode since you've been on you've managed to drop either a really bad swear word a banned YouTube word or covered a topic that is not okay I'm getting better at doing all those things yes you are but yeah yeah we're not putting on we're not doing it um it's just that it comes out mate because once they get into the Sparky Vibe I just I like them on silent basically that's what this podcast is well you shouldn't be on site talking so try me best to being not a potty mouth but yeah but what I wanted to say was what's important for that is we read that and Samsung obviously read it because he picked me up before I'd mentioned it and I've read it and you're right we'll give it a ghost to it so yeah all feed that's the first bit of feedback we've got negative not negative is it but it's the first bit of feedback where someone's raised a good point so they're going oh great show great show because we don't want to get stuck in that that being sucked off basically I mean like we don't want everyone's going to agree I want people to say what's wrong there you go do it listen um Echo chamber that's what I want we don't want to be a lecture we want to say it's good we want people to tell us what's bad like that so yeah cheers to it we appreciate it can we go on the podcast now don't want to do news and stuff Jimbo what's new in your life mate foreign what's new in your life what have you been up to um oh no what actually let's go back a bit mate let's go right back let's go right back to the beginning now did you like so like I said at the beginning you worked for Tom Naji yeah um for a little while was that to finish your apprenticeship or did you do your whole apprenticeship with him no so I before I moved to Tom I was waiting for a company for six seven years I saw my print shirt with them worked for another four years uh got my tests back to them and whatever and then uh upload our picture to a board I'd done a three-phase board and I I think so I was watching YouTube at the time like Tom Nick Bundy arts and whatever so I tagged Tom in it like I said and he you mentioned me if you ever want a job at London messing whatever so like you do your past again and then so just looking for a new job at the time and he just said yeah come up search might be as a qualified spark and that's it for a year I don't really watch much YouTube um but no that's cool so you work with him like obviously you were staying away from home um and now you've gone back to Sunny Wales or rainy Wales especially the weather today anyway it's Dreadful it's been like an email don't worry about it so what what Drew you back to Wales why did you go back away from the Big Smoke as they say it's obviously family you know it's after a year as much as you're enjoying it and loving life you know it's hard you get two days back at home you're cleaning you're cooking yeah you're not seeing anyone you're trying to play footballs you then don't one day and then you just don't have enough time was you digging in London was you yeah that's not good is it it's so painful but as I was saying earlier I was enjoying it when I was doing it I mean you know later I wasn't enjoying I loved it the year it was one of the best years ever but it just you know it takes a toll does everyone go away I I worked away I did that stint you know like when you're younger when you probably appreciate when you first like the time where you go away I did it two years ago like an idiot yeah but you know I don't want to it's good you're only young lad it's all right working around it you go in different places going different props and all that kind of stuff it's great but when when I worked in Barrow there was loads of blokes they're like away from the missus mixed grilling weather spoons every night [ \_\_ ] I'm glad I'm not doing that you know what I mean don't mind it now and again don't mind Josh but it does get you down after it can get you down for a while what a bunch of most normal people would get yeah you have to pay for your own digs when you're staying up or is it covered it was a mixture of both we kind of had a green months basically but yeah Airbnb then hotels oh Mr Big style hotels in London oh yeah yeah it was good though like you know as a young lady it's an adventurer oh yeah he was like I was quite closed well I say closed mind now it's quite close into my town where I'm from like you don't know what's out here I've never like thought I know you've been to London at that point um and go in there yeah it was just it's an eye-opener it does open your eye up so there's a lot more than just your little town oh [Laughter] um no but it's I'm so comfortable in my job I was there but I said six seven years you know it was people do get complacent and you know stuck in your everyday normality to actually doing that it was I'm not scared to do other things like that now like trying different things don't work out that's a [ \_\_ ] really good life that's what everyone listening is you know because I want to so [ \_\_ ] you the sooner you get out of your comfort zone the better if something makes you feel uncomfortable not I don't mean sexual things but if someone makes me uncomfortable like that just do it if you're not used to talking to people talk to them more if you don't want to work away because you nervous about it go and work away because that's the only way you're gonna out your system a lot of public speaking is a big one if if you do want to get used to it so yeah Fair one that's good advice let's just go and do it oh yeah it's like jobs over early in my early years it's like jobs you're like afraid to do is like you you're trying it the next day but I started over time just just get over it just go and do a job in nine nine times out of ten you smash out anyway but you always Panic as you'll know now you're on your own there's no one to go to is that you like no yeah do it you go I'm gonna do this job yeah you've got no one to go and ask you're on your own you're doing the job you've got to you've got to get it done so yeah Fair one see so when you went back to Worlds I remember when you went back to Wales and you was working out your car for a bit wasn't you yeah yeah I heard that was it Chevrolet because I was using had issues my Peugeot so I was using that Chevrolet back and for London it was like a grand and a half I bought it and um I was like lying on money for a van at the moment so I'm gonna have to use that so yeah that was absolutely nightmare but look back now it's like quite funny have you got what you got now have you have you moved up yeah yeah I got a cat caddy Max you know and I got I don't know if you watched Thomas videos but the racking in the back of the Blingo oh sorry yeah yeah so I got that I racked out it's nice and funny enough this fell over a day actually so I got us everywhere in the back of the van but I'm rubbing a snack because it sounds like me I started off in a artist skoda Felicia then I got a voxel Astra estate and then in the end now I've got I think I'm 14 well I'm 49 and I finally got the van I want I got a crew cab van so it's nice to see people going through the same thing and look back yeah I remember the dark days there's only one one thing I want is I want a uh I want a ranger or a amarok completely pointed over the range to be a bit of pain in the ass yeah they are and you'll just want one just want one I want it I can't stop looking at them I'm looking at him all the time on eBay and Auto Trade I just want one I always want the crew cab and I've got one now because I do more technical work I don't need to put links in but doing what I was doing now Contracting I could never have had one because it'd have been [ \_\_ ] up who wants a crew cab but it's not as if you've got loads of friends a mum with four kids a mum with two kids sorry for four of us and a caravan gotta turn the wobble box I know so yeah go away in your van yeah mate I've got a caravan there's a word for that it's called traveler no because I want to go to loads of festivals and that so it's like festivals Isle of Wight Festival raising me there's loads of kids festivals now but I don't want to poo in a box I don't wanna have a shower so I bought a caravan we started some kind of topic here who in their right mind at 40 years old wants to go to festivals anything I want to do less than guys I'll die a river yeah Jimbo do you even go to festivals I have done I I it's not for me to be honest I hate being dirty I need another Show everybody's pies yeah I I I've done beef fast a few years back and it was the most disgusted here I've ever done just yeah I think I just can't believe you drive around in in a caravan going to festivals no I don't get it I don't know if we're friends anymore to be honest it's unsettling well I wanna my name's Jamie Blake and and I own a caravan and I want everyone to know yeah but what I really want to know is more about Jim and he's self-employed we are so off peace we're in the lake again um but Jimbo so you get back to Wales and you think right I could do this by myself now how's that gone feel sorry it's um I didn't obviously the Earth star I didn't know anything about business I've always been just a worker work I work that's the business I think I didn't know nothing um so I spoke to obviously some people I knew um and that an old my old supervisor before I moved to taught me got me in with a company working there self-employed so he was just doing working in hospitals and whatever while I was setting up all my own stuff and just you know gradually building it and it's kind of How It's been and now I was doing that but I was doing that five days a week so then I was doing my own stuff after work weekends I I'm not gonna get very tired and very quickly yes definitely someone today actually phoned me up about doing a there's a fire damage rewire down the road it's and it's I don't know it's about 10 days work they're like you can do it after work I'm like what's interesting Jim is is what you everything you said so far are Mars remember myself yeah and I think loads of people say that you start off in a car moving up to the van I bet you had no tools did you like I'm only got one drill I need this that never it's all coming together now what about the accountancy bit because that's the bit I think most people are scared of I I I'll you tell me how you found that what what's the crap with that bit I don't mind it too much John is I'm quite organized so um starting like are you just using my personal character I was keeping my receipt for for anything I bought the materials and stuff like that you know I was I was quite checking the name envelopes and then I made my own Excel sheet basically where I was just tracked in what I bought where I bought it how much and then everything I earned I just checked 20 away no matter what happens have you been reading my business card this is literally I can't I can't afford your Methods at all can't fall yeah it's just beat it I still don't know I just whenever it comes into my business account now I just dropped 20 away and that's for my NDA taxing what about I can't say because that's what I was getting at but what you said there I would I would I would Echo that if you go on your own 20 of it just put in a Simple Man cards it's not yours and if you've that registered 20 goes in there and all Excel can't fault that because it's basic it's cheap but whatever there is but if you learn to use Excel you'll never get let down and you know that song because you bum Excel I do I love an Xbox 360. I love an extra move on to Sage QuickBooks or whatever yeah but at the start if you say yeah that at the start you'll never regret learn to use Excel when you say accountancy do you mean affording things they are if I was going to say if I had one bit of advice to anyone to go into business yet but I was going to sell myself a business course for 12.99 a month which you can no no the one thing I'd say to people is records records records which you're doing every single receipt is is is a money back of the of the tax van and the one thing I would say is get a good accountant but don't go to like get a good accountant who's at your level so who deals small business I've had one for 20 years has been fantastic this saved me more on the given but I didn't know how you I Tucker that because for someone who don't know that's maybe like an unknown and that is my topic is get a good accountant uh for me for the food I've only had to do one um self-assessment so far really because I've only been like two years self-employed yeah the first self-assessment um the accountant with Tom helped me do it because she was from Wales as well um yeah so she helped me through it the first time um and obviously I might do another one since now um so I'll have to pay that amount note this January which I have gotta page yourself yeah she helped me through it did she I went up there sat down and she went through with me I'm not gonna do it again this time myself so I'd rather just pay you like to see an account and and just just get it done I know I got the money there because I've been putting it away um just yeah Peter went out to do our goal my receipt's ready for um yeah that's what I'm thinking it's like it's weird but I just need to be all if I'm not organized I just get stressed like it's weird I need to know everything's in place I know a guy he might listen so I got to care for you I've done I'll make him generic now we go down to we'd go to work and he'd go come on something with me yeah yeah nice one so you're going down the motorway get the coffers in it cost whatever you two hours away from anywhere and he if it is Ronnie go and get him you jump with the van they sit on the floor Mark what are you doing mate oh I can't put that through my box like two copies in the motorway service station but that was like eight quid probably more now yeah well you can have 20 back of that as that straight away and then you'll get I'm not I'm not sure the international accounts but some of that is a deductible expensive test but if you're thinking like that for eight quid here four quid there three could there if I go by one night I went to the hardware store today I bought some key Rings you know the ones you put your keys on the circles 97p I will put that through my books I don't let anything go if anyone's having that money it's me enough that's not sure yeah but I'm not as normal as Mark which is why I've got here but I think don't let anything get away don't let anyone have anything all you grab is just like a little box in your bank or whatever and just as soon as you buy something just Chuck it in it like for me at the minute I'm not buying loads and loads of materials because I'm still doing self-employed where obviously I do a couple of jobs a week myself and I'm not I'm not like receipt receipt receipt so it's not like massive amounts of paperwork I have to keep on but if I get the odds Friday experience or weekends Fair I'll just check it like I said on Excel sheet catch back up and then it's there ready I well because you're so sense about it which is which is not not always thinking you're gonna be like useless but could you say something about it what what have you learned now what's the one tip you give someone who start their own and you're two years in aren't so what would you say hang on you make sure you do this so I've got a carton so that's where I'm going to go we'll do one I'm going to count to get a good accountant can't go wrong I'm not I'm not rushing I'm not rushing anything I'm not trying to push my business so quickly we're I'm gonna bankrupt myself I'm just slowly like I've said I'm still doing self-employed work I'm not crying out for work I've got my own jobs coming in when I want them every week and I just keep everything organized and just build it slowly I'm only 24 I got plenty of time to grow the business why rush it that's my so I three years ago I think so I got a cheap mortgage I'm set like I just just slowly build that and I'm all right this guy this guy is honestly properly certainly but like you said it cost me like a five hour too perfect because it's a flat no it's good it's good I remember after after Sam's obviously got his own firm because he's a contractor I've had to fall into a cup that I built up from no and uh yeah I'll be honest with you I'll be honest with you I'm it's not really my own firm I am you'll be a sole Trader aren't you yeah but you know what it's this is a thing about being self-employed agency self-employed subcontracting you're not really self-employed well you are and you're not doing you're doing it yeah it's what's referred to as bogus self-employment well yeah yeah really self-employed you've still got all the rules of being paye generally unless you like at the what at the basic level you're still paye right but you just don't have any benefits uh and I'm not saying not what I'm saying is after you've been in it a long time like me you find your way around it and navigate it to work for you so I don't I'm quite free I get to come and go as I please if I want to go home at two o'clock or whatever I can do whatever I want but see that means you're not bogus self-employed don't you that's part of the rule I have worked it so as I can be like that by having good relationships with the people I work for most of the time though if you're just a subject a subby spark turn up with your tools labor only you're not really self-employed you do your tax return at the end of the year that you rinse it out as much as you can to get the biggest lump of money back um but again here's my top tip for anyone who's self-employed don't put through the minimum amount um if you're doing a tax return if you want to get a mortgage or if you want to get any type of credit yeah good one bums you badly because I've been there when we when we went to get our mortgage that was like well you only earn like 26 Grand a year which what do you think you're gonna get and I was like oh yeah I mean because you're you're putting so much through and trying to get the biggest lump at the end of the year like eight grand tax returns and stuff like that you've really got to rinse it out and if you are trying to set yourself up in life for anything don't do that it has a negative effect what I will say as I want to interject is this we run about some won't reply to an Instagram like ours can't be off but we are doing some live right if you want to know anything about subbing or Contracting or agencies Sam is the absolute man to do with it not that [ \_\_ ] said about anything else is that [ \_\_ ] yeah but if anyone is interested in speaking to Sam about that would you like to watch one hour live where you will answer all your questions because he's he's on it enough to do that so if anyone is interested every live we're gonna do some live now where it's ask us anything it's only worth watching if you're going to ask us questions and if anyone likes audio that let us know because I'm sure there'll be people thinking oh what about this what about that I even to Jim like oh you because Jim is in this position anyway sometimes is I've done all right you know what I mean could I do it again now if I was 24 like Jim could I do it again because social media is there advertising is different it's all changing the lunatic at 24. I was a lunatic I was starting from 21 but it's all changed that's what the thing is like I say I was alluded because when I was like yourself but could I you I know you're using social media gym but I don't think I could have dedicate that much time at that age yeah is social media being for growing what you're doing oh massive like yeah 100 I wouldn't have got a lot of my work a lot of my work does come from YouTube people watching my YouTube wow um it's the second week we've had the same thing going up which is really interesting yeah is it we speak means now we're speaking off camera a little bit I was explaining like my YouTube I lose money on I lose a lot of time on it like I like you sit all about I editing me learning use Premiere Pro I spent hours last I was up till like half lever and just editing the video to upload a day allows the second part of it so I'd already spent a load of hours doing am I recording the video it took so much time and like if I gotta pay someone to record me I won't pay things for the video it you lose yeah yeah look at me it's just it that's what people don't realize it takes so much but but take that time I don't have much on a day but take that time and put a monetary value on it would you spend that on Advertising like maybe I used to or people in my generation used to doing little magazines and papers that's an interesting juggle but yeah it's uh but you yeah you know what I mean it's fit good output and stuff like that and you yeah I don't I don't check out willy-nilly though like when I first started kind of crap videos looking back at it now so I only upload what I'm happy with now and I'm not Russian I actually watched you comment on video where you said I think it was core is winning I'm not doing that anymore I'm gonna put uh I'm sure yeah whatever and I think that to be honest I think they're the best YouTubers when they put out on the wrapper yeah they're the ones I watch yeah it is better like I don't like I say we don't I I'm not in YouTube to make money obviously some people maybe but that's not it for me it's more of like a CV people see what I do if people want me to come do some work for them they know what I'm like already so it's just a good like like you say advertisement and it also helps people so it's like right I don't mind doing it but I'm not gonna upload every single week I would never be able to do it yeah what's interesting was obviously read Williston last week it was 20 years old in this world exactly the same thing will so Willis every time it's not a Jeep well that I saw it but Willis was alive um because if it was a Jeep you'd be riding him wouldn't you no he was on last week 20 years difference he's saying the same thing in a different area which was really interesting so yeah so I don't understand how you get local like how you get local work from it because how do they know that you're well I suppose if you're watching it but I don't understand how it works I really don't maybe I'll just sit down I've just had um like people message me you're always a bit reluctant when people met shoes you never know are they a bit like you know serious or they just you know but when you actually get chatting to them you get a Vibe and then you send them quotes yeah I've had loads of work from I'm doing I've got some work for my firms doing it I work I've got my own company but I also work for a firm just because I didn't know I don't mention it much I've got some Works in a certain area of the country I need some contractors first protocol was people that this was today first protocols people I'd spoke to on Instagram and I knew where they were and we chat and I thought well they're on Instagram I've watched the work I've spoke to them they seemed like they're considerate curing well I'll contact them straight away and that's what I did which is so in fact um what I'm saying is I'm too old but I'm actually using it myself which is really weird tell me this quickly what has been the hardest thing about going out and being Your Own Boss uh time like I'm lit yeah I know it is I at the moment I'm up about half five o'clock so it's going to the gym having breakfast then to maybe do a little bit of paperwork after that going into work finishing work coming home editing a tick tock if it's YouTube about the YouTube video and then cooking dinner by that time he's like almost nine o'clock back to bed it's just repeat repeat so yeah it's just time I could do another four hours in a day wow so you're you're pretty dedicated to because what I'm trying to understand is what are your like what is your driving Factor why are you doing this what what where are you going in life what I'm not going to ask you where did you see yourself in five years but what I want to know is what's the end goal for you good question I still to be honest you I'm still working out it changes all the time like my the first thing is everyone just wants to make loads of loads of money loads of money and that was kind of the thing at the start obviously when you start to realize money's not everything you want to be comfortable with money in there but you also want to just be happy live a nice life like what I'm doing now is not sustainable if even if I wasn't in 100 Grand a year what's the point if I'm not using that time my life to enjoy it if that makes sense because I feel like I feel like if you've got the work effort that you're saying like this this grind that you're doing every day you have to have a certain level of work ethic now to have to work like that sustainably you've got to have an end goal are you just a weirdo that likes working like that no I don't I don't know it's just I just want to see how far I can go and to a point where not you don't worry about money where you're comfortable I work with myself every day and get to a point when you're about 50 you've got say like some sort of passive income where you just got money coming in you don't have to work every single day living comfortable um I'm not expected to drive around in Lambos and you know oh you're not going to Andrew take it then no no you never know don't bad mouth top G okay you've got so many people nowhere is that hashtag free top G oh my God I'm not gonna get into it we'll do a second podcast yeah what I wanna know is obviously you do is your work predominantly in Wales yeah so obviously I know we know Wayne he's predominantly well so do you fight over that small patch or issue at the minute it's like probably a point a bit more anime I'm still doing a lot more like a lot of self-employed work consistently I'm pretty much for these like Serbian working for a company or I done my friendship with um and doing your own work that's the same yeah because basically like I got a loan to my van um which I want to pay off and we obviously I got the mortgage bills and whatever so I want to that's a guaranteeding income for me every single week with this company they want me to begin we get out um that's guaranteed money for me and then I have one or two days off a week doing my own stuff which I get consistently where I earn you know better money than I am working for the company and I'm on my own for two days and then I'll like I say and I slowly just build it out over time now where maybe go down there three days on my own then food but no rush to just jump out in the deep end time I'm happy doing industrial work yeah so I I love doing the industry I much prefer industrial commercial over domestic if I understand that for myself I need to do domestic but the same time I really loved doing Industrials I kind of want to keep doing after the next 24 years either way so I will be subjecting for the next you've got to do it right you take away you can don't you I remember like being set up for industrial work in a van they're going and fit some dialogues from log there because when you're starting off shit's got to be paid for yeah no it's the thing is with all this like I can't do I I hate doing domestic work because when I moved down here I was going out on my own and I went I went and got my 18th and I signed up to nape it and all that sort of stuff I was ready to go out on my own and I picked up loads of work like locally I was doing quotes every night I didn't I I got a job at I actually done a job in the school all kinds of stuff locally but I didn't like I missed I missed doing commercial industrial I didn't want to Fanny about in people's houses I hated it in the end I had a couple of really nice clients locally and then when I got that school job I was like you know what I just want to do this I I think it's too domestic it's also got some people love it don't they but I'm again I'm the same I just cannot be asked with it at all even though the record podcast even makes us getting the fuse board I don't care if you're a next door neighbor not happening done Dustin and fair play to empty people that do go out dragging super odds up walls and putting their hands through dead screws in floorboards and choppy little holes because they're just decorated in on all that stuff just can't be dealing with it at all no yeah it's just I the balance I got in a minute is nice I'd like to be on my own for a couple more days probably but like I said it's more I got a guaranteed income at the moment so I kind of need the payoff and loans and then I probably will do more myself but I'm just enjoying the balance I enjoyed like said to an industrial way I'm still learning a lot the industrial they'll never stop moving in that sector and and just keep doing the domestic and just like I said find the right customers I'm not desperate for customers I'm not going to work for I know sixth grade A day or something I pick kind of pick my jobs if I don't want to do a job I don't have to do it to go on my wage in anyway and then um like you're going back working for a firm I mean when I start off I used to work for a Tarmac which a LaFarge which were blue circle if I remember back in the day doing making cement stores I went left there I went from being a heavy industry electrician on a process control cement Works to to finally running people's asses and when they asked me back to do some work from a bit Randolph because I was getting paid on my own to do work for them and in the end at one point I did a three-year stint for him I got come off site for about three years and I went back for another five years and that's quite a large portion of my thing but there's no wrong we're going somewhere constantly they have to pay wages they might employ adult you provide them with service aren't you yeah no it's it's just yeah until um let's see I I find a lot of people Jump Street in the deep end and rush rush to grow their business like it's a massive rush to do it but I just don't I don't see the Russian myself 24 I've got a plenty of time to just slowly build my client base up find the right customers and just yeah go and just do it slowly it's wise person what would go after yourself what I would always yeah is what what I'm sure everyone regrets when you start yeah no matter how many velocity Banks you've got DeWalt tools you've got um backhoe sockets that you've got and all the other [ \_\_ ] that I've got now and that you see more older spots on Instagram yeah it doesn't matter a foot when you first start ah if you have to carry Tools around the bucket you do that don't you but a lot of people think you need all that gear to start when you don't you just need to be a conscience of spark who could do the job not have everything the best it can be so from so are you going to Branch out on your like Branch out and try and get some commercial work some industrial work or well I think that I think that's a secret sauce for someone like yourself you're obviously industrious you obviously want to go and Be Your Own Boss but like maybe if I was if I was 20 if I could had this brain at 24 I'd have probably tried to get into doing my own commercial work I agree but there's a lot you need money behind you I find it with commercial industrial you need like OT at least 10 grand you can do it in my opinion you could do a lot of the industrial commercial jobs and so that's when you start getting into your payment into like three months that's when business start to struggle I'm not know any of that like that level yet so I don't even want to touch industrial commercial until I got a bit of money behind me all my like and I see accreditations and all of that just oh yeah that's miles away miles away from where I am but I will get there no doubt but yeah I could have done looking back because I'm reminiscing that proper like I could have took on massive jobs and I could have been making loads of money but you've always got a chance you could go bust and I know people that have took on like massive blocks of flat and they're just gone they just main Builders took him and I was I wanted to study I weren't studies who I think it was a bit more blase you know what I mean you want to start now but um I'd still didn't take on bit I was just looking to go you know what if that if that Builder because I'm I'm knackered so I walked off but there's a lot of funny I've worked with this geyser right I I'll call him a friend but he's a such a Maverick right so when I was back in Croydon he's agency spark he lives he lived he lived uh local to me and we've been on a few jobs together and stuff like that and one day he phones up he goes I've got job for you do you want to come and work for me I've got block of flats I was like what are you talking about have you managed that he goes mate I just chanced it he said they Supply everything I just Supply labor and I run the job for him and I was like all right sweet so I went there it's good money real good money real good screw he never even turned up at all he went into it knowing that the job was all like he went into it as a money grab and I'm not saying it's a good thing or a bad thing yeah yeah I would totally MoneyGram do you know he made 200 grand out of that in it 200 grand out of the job they kicked him off the job at the end because it is [Music] yeah yeah and you know what there is I don't know if you get them as much anymore but because everyone's screaming up aren't they but there was jobs where you're like [ \_\_ ] I can make like 400 grand out of this and I've gone you know what I just got if I ever got a bad Vibe and I know no one can explain something that's like my mate got me for a job fitting some generators in hospitals like I've got a totally bad Vibe about the main contract I'm not doing it he's like what do you mean you [ \_\_ ] if you could make a fortune and never know what happened don't nothing went good or bad it didn't matter we've got to go with your instinct oh yeah I mean if this isn't a busy situation he set up he's a limited company yeah went into it he'd put his invoice in and hoped to get paid and then they get paid a dish out to the lads yeah and then they keep the cream for himself he went into it knowing that he was gonna get [ \_\_ ] at some point it's our original because do you want 30 spark he's knocking on your door at night because I don't no no but he kept enough of the cream to cover it when it would happen but then made 200 grand out of the job he just went in with it he went in balls out cleaned up but again it's a risk he could have gone in and got absolutely much yeah it was a success story it's not a Greatest Story it's a bit naughty no no it's one of them I would imagine starts off I'll sit there one night on the kitchen table rubbing the thumbs together and going sure what should I do here I know they're the ones that make or break don't they I forgot the bailiffs going back around for your van or are you walking away with your underground but eating that one what I've all said about this is yeah no one's teaching you actually on a course either yeah no one's even even people like if you've got him on now and sat him here he wants totally hard to make money with her I can't turn out to make money I've done all right but I can't I've got I've only got advice he's a bit of a duck and diver and one day I might see if I can get him one of that they're the best ones that aren't there you could do it if you've got a bit of buns he just pulled off the like a massive cash grab 10 minutes from his house they're building these flats and he pulled off this cash grab by just going in there balls out saying yeah I'll do this I'll Supply the labor you supply the gear I'll run a job yeah this Advocate the this Gage of running the job for him I was there working I went there long because it was a weird job and then plus I moved and mate he cleaned it up just by having the balls to go in there and do it set his own terms they bit his hand off and he just yeah 200 grand out of it and good luck to him if you are if you are going on your own and I think I met I thought I said I want to mention it because it relates to other people said then yeah there's one thing you do need do you know what it is everyone's gonna admit to having a bit of this come on look oh fully it's one way or the other like you can be the you can go on you can read every autobiography by every businessman in the world got all the business courses read the hmrc inside out and it all just boils down to one day whether you're in the right place or the right time or you've got look at Jim will probably get it probably be in the right place of our time to go I've seen you on YouTube I I own a massive I don't know widget making factor I want an electrician I literally went around to do one of my mate's jobs uh a guy called Kenna he might listen he uh he used to fit kitchens Electric's kitchens he became Sparky short core spocker did the electric kitchen so one day he goes I'm running a guy's ass um he wants Sky putting in to his bedroom and I don't know how I do it will you come and do it for me so I went around there [ \_\_ ] ass was massive yeah a guy owned a big ink Factory like that make if you've got a label in here that's got ink in it they make it and he went I need to work doing that manufacturer seven years of work before it paid money good job no I mean I I I can't teach anyone that that just happened but I was in the right place at the right time and it just happened and I think everyone has one of those moments as much as everyone have one of their moments where they're like oh what the [ \_\_ ] I've done here so yeah you can't it's just I think there's a lot of luck involved personally and I would always say that to anyone starting out yeah how important do you think though there's a question to both of you is building a good reputation like I know a couple of people who who are getting so much work now because they're reliable and they do a good job and it is they're batting it away yeah I I think the basics people forget is like just turned up on time like I tell a customer I'm gonna be there I'm there at eight and I'll just clean up and get a job done like and that is it I think that's all customers want sometimes I tried to explain to people like I I haven't joke with a boy sometimes in work or some of their customers we actually do work for how much I charge myself we're trying a lot and they're like but you can't charge off yourself like I can't some people want to pay and just have a tune-up on time get a job done and that's all they want people pay the money for Reliable service that will go across everything so in my game that is like so the the subcontracting game all the new guys and like where I'm doing a lot of like I'm in a more like management roles now I just say listen you gotta make yourself valuable Stand Out amongst amongst the others and you do that by turning up on time every day even if you don't stay the whole day at least turn up on time and turn up consistently and you will become more valuable to people because the worst thing in the world is booking a Tradesman and then not turning up because that's that it throws your schedule out well I love that is um because she said both that is a great one I would I totally agree with that but other one is communication if you're relate bring them up and I'm late mate I've just done this I've done that that's sort out for you what you have to do you're late well no not not if you like one of the regulars like every day you bring it up but if you are known for being on time and you're late mate I've seen what's happened today communication is key people just want to know where it is what's happening uh it's bring what that job's done I'm doing this one talking to people I agree with you I've known where they are look what I'm saying is if you are the guys early every day don't not ring up because you're really just honest honestly goes a long way don't it and big communication I would say and tidying up if you're if you're in a domestic one tidying up if you're if you're an electrician on a building site you don't do tidying up that's not what we went to college for three years for you won't get a chef to watch your own pass would you no you don't so let them tidy up but if you're in someone's house unfortunately you have to use something called a broom that's Planet brush or a Hoover now I don't really know what they are my wife would tell you I don't know but yeah there's some good stuff come on tonight I think anyone who's starting out I mean if you've got to start this year [ \_\_ ] good luck to you not me no Joe what apparently well I'll just we I said earlier that I looked for some Sparks off Instagram the email I got of my boss this isn't commercially sensitive yeah he said I've contacted a load of local sparkies and every single one of them said to me sorry I'm really busy with the work and they are a company you can Google us and see our bigger company are you know I mean you can you can see you're going to get paid the reliable firm but he says literally nice conversational people really sorry I can't fit you in so maybe the economy is not as bad as it looks trick well no because you're [ \_\_ ] you're not in that area of the country that's why whatever yeah I think I think yeah we have an idea issues with myself at work or the company I'm doing work for now they haven't had any issues really with work so whether it's a thing we notice a bit further down the line the knock-on effect but people still still seem to be wanting to spend the money especially commercial industrial people have to spend the money to make the general just from getting from this conversation is we're all agreeing that there is work I'm not going to say plenty but there is work there yeah but I'll tell you what's not there is the right people about every thermal winch about talking about this so and they they're talking about the skill shortage and like how there's not enough electricians and stuff which is great for us it's great for us really those who are electricians now competent and and capable can go out there and earn a bit of dough and earn some proper money I suppose if you're starting on your own think about you should say to yourself look at yourself here and go I'm a wank and if you say no go on your own if you say yeah stop on the books yourself I'm a [ \_\_ ] or am I alright because if you're all right if you're a good sparker I stand by this to the Dead Eye yeah if you are a good sparker you'll never be out of work but if you are a [ \_\_ ] you'll always be you'd always find pay while you work but yeah just be honest with yourself about that pay job like I don't know if you guys keep keep your nose to the ground or anything but when you see like on indeed or something they're like 38 to 41 000 pound a year for paye spot I've seen less than that today um I've had a couple of emails just before I got up here one of them was a commission engineer yeah I'm not sure what for I think it's machine a bit that's a skill job you need to not own it on the machine goes in and works but I have to tweak it to make it work yeah and it was 35. are you [ \_\_ ] nuts are you taking the piss it's so fine I just it's like don't get some said this before it's only a race Sam's Crow If it's only a race to the bottom if you're getting the race in it exactly like if you see that job for 35 Grand this one thing I could do that but I'm not taking that pay cut there's a good chance next month it'll gone up because they haven't found anyone that's an interesting point actually how are you I just got out my head so dumb oh it's back hold on when it comes to pricing a job obviously you're not caught up in a race to the bottom because you can be choosy how are you finding that and is that something that you've had to consider yeah so recent I was just um the way I've always thought is how long that job will take me I I know myself how much I need to charge and I'll just divide that up and how long it's going to take me if that makes sense but lately I've started to find that I'm getting like more quotes obviously month by month so it's hard to get these places to check how long they're going to take like some people I want two lights all right well that doesn't really help me um so I've said it to a lot of people now all right this is my start our first hour cast and then every other hour is this much and it's just easier for me obviously I get a rough gauge how long something's going to take so I know if I can book two jobs in that day or just keep it as one and that's it so I prefer doing it giving on my hourly rate unless I know exactly how long something's going to take I'll just see my day rate then but are you finding yourself getting like because a lot of people moan about oh there'd be someone like I don't know putting an EV charger oh there'd be someone to do it for 150 quid rather than charging 400 quid in labor they'd do it for 100 Credit in labor are you finding yourself coming up against that and do you care about coming up against that because you know your skill set you know what you can do and you're not interested in joining that race to the bottom no I don't get involved area if people want to go for a cheaper quote crack on it but it makes a difference to me I I know my standard of work is always good I'm never going to rush a job I know what I'm going to do with these types of people don't want to pay for it fair enough I never understood and well I have understood that people really really believe in this race to the bottom and I did at one point when it was when I was all involved in unions and all that old [ \_\_ ] there was a race to the bottom because we all believed that we was worth more and we weren't getting it and that someone's going to come over from Eastern Europe and take our jobs and stuff like that but when you realize you are in charge of what you accept from life it's your choice to accept these [ \_\_ ] um [ \_\_ ] rates these [ \_\_ ] customers is entirely your choice you don't have to I know I know I know why people do it it's like some people like myself like people like me would have just jumped straight into people and no Serbian work they need to go work every single day so they need because people sometimes are working for nothing aren't they this is what I'm saying so it's like they're undercutting themselves they're working their ass off every single day to try and grow their own business but they're eating peanuts every day because they gotta charge cheap to get a job and it's it's just not worth it it's like that's why I prefer doing what I'm not saying it's right where I'm doing I don't know like no expert but I find it like I said I got my set wage I can pick what jobs I want and I'll just slowly do it like what I do for me I just don't understand the jumping in balls deep and just you know getting hectic charging low like six pretty 80 hours and I was like why just go self-employed build up your customer base slowly and then go from it that's my opinion but whether that's right or not I've said before it can be assessed but like you know there's a lot of electrical groups on Facebook like yeah this says pits it's just people taking a piss off each other right right or wrong people I'm Advanced whatever but what's what after saying what a troublesh is if we was more of a community and stuck together more we'd all be better off if people weren't undercutting people off what's gonna happen I know it's not I know but what I'm saying there's no place to discuss it all we can do is maybe get that Vibe out I know people go but if someone in Manchester saw in Liverpool said well what you charge and I'm charging forward well I charge forward they're not in competition with each other but they're managing the price to a reasonable rate but when you get the local competition it don't work yeah and I agree it doesn't work I know I know exactly what you're saying and and it's done but if we I don't know but what I'm getting at is we're only shot ourselves if we're shutting each other you know what I mean it only ends up coming back but again you're right though in that there's no way you can't prize wreck it you can't have Facebook groups because you get [ \_\_ ] on there being [ \_\_ ] yeah but there's no way of controlling it this is the thing with them Facebook groups as well so this is what killed me this is what killed me in unions ages ago right so when I sat up the union boring boring I set up a union and boring up yeah what you're not allowed to do with with a union is have Union only jobs that's a close shop they do that in America they don't be interesting they do that in America so you get on a union job you're looked after you can't just have Union only jobs but what I've done was I found a company that needed labor and I gave them access to our membership pool so they could recruit from it yeah on on a Proviso they paid 25 pound an hour eight till four and this is this is a good few years back when the rate was 17 18 19 pound an hour and then after that there was like an uplift and stuff like that I was it was my crowning achievement it was a lot there's two years worth of work is my crown and achievement I had negotiated that mythical 200 pound a day for eight hours work for agency Sparks and for self-employed sub-sparks on the agency circuit in London Joe what they turned around and said well that [ \_\_ ] I was like how much you earning at the moment I was just like what do you want for me oh and you know what the deal breaker was the deal breaker was the Giza said what I do want though is I want people to turn up with an impact driver and that Combi drill not an SDS yeah yeah on B drill the Uproar the Uproar from people in the groups was mental there's like I'm not turning up on Comedy Jewel that thing is there's no such thing as a Utopia and I'm not suggesting there's gonna be but what I will say is I think the people that listen to pods come do like good stuff on Instagram there are different Beauty sparkies the bottom ends of the one corrender Sparks and the [ \_\_ ] under Sparks and that they're not on social media they don't care you do bump into better people on here and it's a Wise Pool to pick from as we find out at the start when Jim's on about you just but you always get those Renegade [ \_\_ ] that you go right we've got your gold plated SDS a gold-plated Commodore drill we're gonna drive to work everyone in the Ben layer you're going to get paid four grand they go well well is the food free lonely not only did they say that was it uproar about a Combi drill yeah the cases I was I was working in the same building as some of the geezers moaning about it who had all of their [ \_\_ ] with them they've got it already but yeah you've got all your [ \_\_ ] with you already and they're like no way I'm working the same building as you yeah but I'm doing it on price I was like what are you talking about it there's always there's always the the frequent contractors you know they never go on their own because they wank but this obviously every every every single train has got a minute there's always the [ \_\_ ] at the top of the [ \_\_ ] of them but I'm just a politics it's the same if you're in the middle floating around you can always get on Courtney and B you know United this is the question to end the show Jimbo are you a [ \_\_ ] at the top or a [ \_\_ ] at the bottom whatever forever it's I think the thing is like what I want to end on is it's been good it's been good to listen to you and I'm sure some people it's this because they're starting off yeah where have you got your best advice from hey I thought oh to be honest it's probably social I don't know I'm not you ain't got to say if it's everywhere say me you're never coming back on it's kind of a bit it's kind of a bit of everywhere you take a bit of advice from everyone you speak to me in life you just that is probably the best thing you could say because that means everyone can find out can't there so like so Wendy's answer of all time I just pick it up from everyone like I I've had people telling me I had everyone tummy don't move to London best gonna do is move to London I took my own judgment on there and then I have a little advice when people do this do that and I'll take it on board what I want to take on and then use it to whether I think it's good or bad but so you take listen to everyone's advice then make your own mind up there you go what a [ \_\_ ] guy I don't know everything obviously I I could be making the wrong decisions every single day on growing a business I don't know but you should do your own thing I'll tell you this one yeah and a lot of people know this one before yeah and I'll say this if you're in business here's your rules yeah I forgot the rhyme what's the rhyme profit is Vanity cash flow no [ \_\_ ] you know what is it ah we're out"

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"VideoID": "416",

"Title": "House Roof Electrical Conduit pipe detailed Explanation tamil",

"URL": "https://www.youtube.com/watch?v=wrG7OodlWRw",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign so first elevation length m foreign foreign foreign foreign [Music] paper [Music] middle corner foreign say [Music] foreign [Music] [Music] is foreign attached bathroom [Music] by subscribe"

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{

"VideoID": "417",

"Title": "Top 7 basics electrical wiring | basic house wiring tips for beginners | Circuit Tamil",

"URL": "https://www.youtube.com/watch?v=tsh3c3RbQtI",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] hi friends [Music] foreign [Music] foreign [Music]"

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"VideoID": "422",

"Title": "How to install floating electrical panels.#Shorts.",

"URL": "https://www.youtube.com/watch?v=0DNFsxjTD-o",

"Keyword": "Electrical construction techniques",

"Transcript": "a [Music] n [Music]"

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{

"VideoID": "427",

"Title": "Two Wattmeter Method of Power Measurement - Three Phase Circuits - Basic Electrical Engineering",

"URL": "https://www.youtube.com/watch?v=0BMU1qLzFhg",

"Keyword": "Electrical construction techniques",

"Transcript": "Hi friends in this video we are going to see 2 watt meter method in order to measure three-phase power in different types of loads logically speaking I should require 3 watt meters in order to measure power for three phase load but this method will illustrate that only 2 watt meters are sufficient in order to measure three-phase power so we will start with the first type of load before that lets list out how many types of loads we are going to deal with so first we are having star connected lagging power factor load lagging power factor load is nothing but a inductive load then we will be changing lagging power factor load to leading power factor load but connection will be star only leading power factor is nothing but a capacitive load next we will change star connection to Delta Connection once again its a inductive load and finally Delta connected leading power factor load we are going to see derivation for all the 4 types of loads lets start with the first that is star connected lagging power factor load so here we are considering that R YB three-phase supply is there and that is feeding a star connected lagging power factor load so dollar watt meter 1 which is connected in R phase then I have second watt meter connected in Y phase and B phase will be as it is so this is our watt meter connections are made and this is connected to star connected lagging power factor load so here I am having the star connected load this is R phase Y phase and B phase so it is connected like this the phase impedance is Z ph it is a balanced three-phase load lets mark all the quantities over here so this is R phase Y phase B phase the voltage between two lines here it is V RY V YB and between B and R it is V BR same way current carrying by each line is the line current so this is IR IY and IB lets go to the phase side as phase side this is called as a phase between R and N and the voltage across these two point V RN phase voltage between YN V YN another phase voltage and third voltage is V BN similarly i will have a current I RN I YN and I BN lets list out all this so V RY V YB V BR is VL line voltage then we have IR IY IB IL line current then at phase sight or load side I have V RN V YN V BN as V ph phase voltage and current I RN I YN and I BN phase current I ph and we have Z pH as phase impedance 2 watt meters are connected like this we call this as a watt meter 1 this watt meter 2 lets go to next step now we have connected 2 watt meters like this let's write out their readings so the next step is watt meter readings lets discuss first watt meter 1 watt meter 1 is connected such a way that its current coil will sense IR a line current for R so I will write over here current that is sense by watt meter 1 is IR similarly if I see voltage coil it is between R and B but you cannot take a V BR because current entering like this hence this is more positive compared to this so I need to consider V RB instead of V BR because of entering direction of current IR so the voltage sense by white meter 1 is V RB if I know current and voltage the watt meter 1 reading will be V RB multiplied by IR multiplied by cosine of angle between V RB and IR if I see properly V RY V YB V BR or I can take a V RY V BY and V RB as line voltage and IR IY IB has line current so what I will get over here W 1 is nothing but VL IL but here you cannot write VL and IL because here it is very much specific it has to be angle between V RB and IR lets do same analysis for watt matter 2 watt meter 2 it is like this current coil of watt meter 2 will sense IY and voltage coil will sense a voltage V YB so I will get watt meter 2 reading V YB multiplied by IY multiplied by cos of angle between V YB and IY V YB is nothing but VL and IY is nothing but IL both of them are line quantities so W 2 will be VL IL cos of angle between V YB and IY so these are the 2 watt meters reading I am getting now only objective is we need to calculate angle between V RB and IR V YB and IY that angle we are going to calculate with the help of phasor diagram so angle calculation or you can say angle determination can be done using phasor diagram this is the most important and crucial stage of a derivation let's draw a phasor diagram so we always start with a phase voltages so I will consider the phase voltages I'll start with a V RN lagging V RN by angle 120 degree I have V YN and leading we are in by 120 degree I have third phasor third phase voltage that is V BN Load is lagging power factor or inductive in nature what does that mean current laggs voltage obviously phase current laggs phase voltage by angle Phi so I will have phase currents like this my objective is to get a angle between VRB and IR first so V RB is nothing but V RN minus V BN so V RN is like this I should have minus V BN so equal and opposite to V BN I will have minus V BN like this and the phase in addition of V RN and minus V BN will be V RB similarly I should know what is the angle between V YB and IY for that V YB is nothing but VY and minus V BN so already we have minus V BN just phasor addition of V YN and minus V BN will be V YB now V RN is a phase voltage similarly V BN or minus V BN is also phase voltage V RB is a line voltage so obviously the angle between V pH and VL is 30 degree similarly over here V YN is the phase voltage V YB is a line voltage so angle between V YN and V YB is 30 degree and for star connected load I RN is same as IR so I can say I RN equal to IR because phase current equal to line current for star connected load so ultimately what I will get is this angle between V RB and IR is 30 minus Phi and angle between V YB & IY is 30 plus phi this is the most important outcome of the phasor diagram so now once I know the angle between voltage and current I can write watt meter 1 reading as VL IL cos 30 minus Phi I will consider this our equation number 1 and W 2 as VL IL cos 30 plus Phi equation number 2 now I am adding 1 & 2 I will get W 1 plus W 2 equal to VL IL I will take common in the bracket I get cos 30 minus Phi plus cos 30 plus Phi I am going to use a simple trigonometric formula of cos C plus cos D as 2 times cos C plus D upon 2 multiplied by cos C minus D upon 2 so if I use this formula I will get W 1 plus W 2 as VL IL 2 times cos 30 minus phi plus 30 plus phi upon 2 multiplied by cos 30 minus Phi minus 30 minus Phi by 2 so after simplified I will get 2 times VL IL cos 30 degree multiplied by cos minus Phi cos minus theta is same as cos theta and cos 30 is root 3 by 2 so ultimately I will get W 1 plus W 2 as 2 times VL IL root 3 by 2 multiplied by cos Phi so if I simplify I will get W 1 plus W 2 equal to root 3 VL IL cos Phi which is nothing but a total power consumed equal to P so what is the conclusion out of it addition of two watt meter readings with nothing but a power consumed in a 3 phase circuit so I will consider this as another equation so P equal to W 1 plus W 2 which is root 3 VL IL cos Phi equation number 3 now I need to find out the power factor of the circuit by knowing 2 watt meter readings for that purpose I will do one more operation I will subtract equation 2 from equation 1 so it is W 1 minus W 2 equal to again VL IL is common in bracket I will get cos 30 minus Phi minus cos 30 plus Phi Here I am going to use a formula cos C minus cos D that will give me minus 2 sin C plus D by 2 into sin C minus D by 2 so lets apply so I will get W1 minus W2 as VL IL in bracket minus 2 sin C plus D divided by 2 into sin C minus D divided by 2 so if I simplify I will get W 1 minus W 2 equal to minus 2 VL IL sin 30 multiplied by sin minus phi sin 30 is 1 by 2 and sin minus phi is minus sin Phi so if I incorporate these values I will get W 1 minus W 2 as 2 times VL IL multiplied by 1 by 2 multiplied by sin Phi 2 2 get cancel I will get one more equation W 1 minus W 2 equal to VL IL sin Phi I will consider this as equation number 4 what I will do I will divide equation 4 by equation 3 so W 1 minus W 2 divided by W 1 plus W 2 equal to VL IL sin Phi divided by root 3 VL IL cos Phi VL IL will get cancelled from both the sides and if I take a root 3 this side sin Phi upon cos Phi is tan Phi and from this I will get phase angle Phi as tan inverse of root 3 W 1 minus W 2 upon W 1 plus W 2 so to get a phase angle of the load 2 watt meter readings are sufficient and it is related like this Phi equal to tan inverse of root 3 multiplied by W 1 minus W 2 upon W 1 plus W 2 by knowing the phase angle Phi I can get a power factor which is nothing but cos Phi so ultimately power factor of the load is cos of tan inverse of root 3 W 1 minus W 2 upon W 1 plus W 2 so here we have seen for star connected lagging power factor load addition of 2 watt meter readings is nothing but a three-phase power and by knowing the watt meters reading I can get phase angle Phi thank you"

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"VideoID": "428",

"Title": "Girl Scouts camp teaches construction trades",

"URL": "https://www.youtube.com/watch?v=73Jv0Dp5VUg",

"Keyword": "Electrical construction techniques",

"Transcript": "I have a girl scout in our life. I was a girl scout. Still got my little girl scout law thing. Uh If we don't, we definitely love all the cookies, right? Love those cookies. But the girls are learning more than just selling cookies. CC Gaines explains my other moments like this. Probably look familiar to many of you in that summer camp. You use all of that. This group is made up of girl scouts hanging out at Camp La Amaga in Scandia Archery, canoeing. You get to be outside here in nature, then you get to meet friends. But that's not all these girls are doing. They're also exploring the construction trades industry, but it's hands on. You have to press pretty hard. I'm a hands on learner. So it's easier for me to learn that way. Can you hold it on? The program is called Power Girls. And it's further proof that the girl scouts are more than just cookies, camps and crafts that got us to 100 and 12 years old. But when we think about the next 112 years, what do we want our girls thinking about and talking about and what do they absolutely need. How many of you? Is it your first time at Power Girls? That's Marissa Williams. This is my first time. Girl. Scouts River Valleys. O she says Power Girl started in 2018. This is actually the outside. So you're going to flip it. I love just like doing all these small activities. Slide it in there. Here we go. Girls get hands on learning and carpentry, electrical wiring, sustainable design and much more. Let's think about my finger. We're realizing that leadership development is critically important, but that has to be wrapped around with some skills and some competencies. You're gonna do the two sides. First, the girls get to interact with professionals already working in the trades. So if we wanna split into two groups, if you don't see yourself in that career, you don't necessarily know that that's available to you. You can use your other hand on the back of the screw gun. There you go. Each day focuses on a different discipline. I've never put in a window before, never broke it. I see it first a little bit and my girls leave camp. They take what they've learned with them. Definitely helped me do like household projects. I figured out how to wire a light switch at camp and they take new possibilities with them as they look toward their future. For some of our girls, probably about 15 years from now that they'll be thinking about college and career probably. I'm gonna go into construction for some of them. I'll go next. This is coming up in the next three years. So it's fresh in their mind. What's possible? Yay, yay to the girl scouts. So thanks CC for that story. Uh We are with the Vikings World."

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"VideoID": "429",

"Title": "6 Amazing Electric Life Hacks !! Electric Tips &amp; Tricks / 6 Electrical Tips /Electric hack /hacks",

"URL": "https://www.youtube.com/watch?v=bCxExtXPgWE",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Music] do [Music] do [Music] [Music] [Music] so [Music] [Music] [Music] so [Music] [Music] so [Music] do [Music] you"

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"VideoID": "433",

"Title": "Lintel Wireing | Wiring |electrical Lintel | Best Method for House Elacrtical Work | Low cost | Mud",

"URL": "https://www.youtube.com/watch?v=F64-6\_eMiFA",

"Keyword": "Electrical construction techniques",

"Transcript": "foreign [Music] birthdays [Music] [Music] thank you [Music] thank you foreign [Music] [Music] [Music] thank you"

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"VideoID": "441",

"Title": "Safety First Best Practices for Cable Construction Workers",

"URL": "https://www.youtube.com/watch?v=LvJnfynRL6c",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] hey there welcome back to cybersphere Chronicles I'm here today at an active construction site to talk about something that often gets overlooked but is absolutely critical safety working in Cable Construction is tough and whether you're dealing with fiber optics electrical cabling or heavy machinery safety should always be your number one priority in today's video we're diving into the best practices for keeping you and your crew safe while working with cables in the field before we get into the best practices let's first acknowledge the risks involved Cable Construction work isn't just physically demanding it can be downright dangerous we're talking about risks like electrical shocks Falls from Heights Equipment malfunctions and even exposure to hazardous materials it's a job that requires constant vigilance and attention to detail but the good news is with the right cautions and safety protocols in place you can minimize those risks and make sure everyone gets home safe at the end of the [Music] day let's start with the basics personal protective equipment or PPE every cable construction worker should be wearing the appropriate gear no exceptions hard hats protect you from falling objects safety glasses Shield your eyes from debris and gloves help prevent cuts and burns and don't forget about high visibility vests especially if you're working in an area with heavy machinery or traffic wearing proper Footwear is equally important you'll need boots with non-slip soles and steel toes to protect your feet from both electrical hazards and falling objects trust me PPE may not always be the most comfortable thing to wear but it can make the difference between a minor incident and a major injury next up is electrical safety when you're working with live wires or high voltage systems the risk of electrical shock is real one of the simplest but most effective precautions is to ensure that all electrical equipment is properly grounded this reduces the risk of shock and prevents dangerous electrical currents from flowing through your body always use insulated tools when working with electrical cables and never assume a wire is dead just because it's not in use always test it first and of course make sure that you and your team know how to lock out and tag out electrical systems before performing maintenance or or repairs this prevents anyone from accidentally powering up a system while you're working on it cable handling lifting and installing the right way one of the most common injuries in Cable Construction is related to improper lifting and cable handling cables can be incredibly heavy and if you don't lift them correctly you could easily strain your back or Worse here's a tip when lifting cables or equipment always bend your knees keep keep your back straight and lift with your legs it might take a little longer but it's worth it to avoid injury when installing cables make sure you're using the correct equipment for the job whether you're running cables Underground through conduits or across rooftops you should always be using proper tools like cable pullers grips and conduit rods to reduce strain and ensure the job is done safely working at Heights secure yourself first now let's talk about working at Heights whether you're up on a ladder a scaffold or even a utility pole Falls are one of the leading causes of injury in this industry if you're working more than a few feet off the ground you should always be wearing a safety harness that's securely attached to an anchor Point remember it's not enough to just wear the harness you need to know how to properly use it check for any signs of wear or damage before each use and make sure it's adjusted correctly for your body falls can happen in an instant so take the extra time to secure yourself before starting any task at height another important aspect to consider is the weather Cable Construction work often happens outdoors and that means dealing with the elements wet conditions increase the risk of slips and falls and rain or snow can make electrical work even more dangerous wind can also pose a hazard especially if you're working at Heights or handling large equipment if the weather takes takes a turn for the worse don't hesitate to stop work until conditions improve it's always better to delay the job than to push through unsafe conditions and risk injury and of course dress appropriately for the weather cold wet or extreme heat can lead to its own set of safety issues like hypothermia heat stroke or frostbite one of the most important aspects of safety is communication if you're working on a large site with multiple teams it's crucial that everyone knows the game plan establish clear lines of communication whether it's through radios hand signals or daily safety briefings this helps ensure that everyone is on the same page and aware of potential hazards make sure your team knows how to report any safety concerns or incidents no matter how small something as minor as a frayed cable or a loose Ladder rung can lead to Serious accidents if not addressed right away even with the best safety practices emergencies can still happen that's why every worker on site needs to be trained in basic first aid and emergency protocols whether it's a fall an electrical shock or an equipment malfunction knowing how to respond quickly and effectively can save lives make sure your team knows where the nearest first aid kit is and that it's fully stocked have a clear emergency evacuation plan and conduct regular safety drills so that everyone is prepared in case of an emergency at the end of the day the most important thing is that everyone goes home safe Cable Construction is a demanding job but by following these best practices you can significantly reduce the risks and keep yourself and your team protected if you found this video helpful or have any additional safety tips to share drop a comment below and don't forget to like subscribe and hit that notification Bell for more Tech and safety insights from cybers sphere Cron Les stay safe out there and see you next time"

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"VideoID": "443",

"Title": "WE HIT A GAS LINE! | What I Learned | Electrical Panel Upgrade Underground Circuit Tracing (A MUST)",

"URL": "https://www.youtube.com/watch?v=I18o2qHAY5U",

"Keyword": "Electrical construction techniques",

"Transcript": "we hit a gas line our gas line is right there cuz sometimes they miss if you are doing underground panel upgrades you got to have one of [Music] these all right so we're working on this underground panel upgrade right here our utility company wants us to be like 36 40 in deep and right here I don't know if you guys can see or not we started noticing sand right here so I'm pretty sure that the gas line that's right there goes right out this way it was marked out but I want to double check it we have our own underground Tracer quick tip here is this wire that's wrapped around the gas line right here this is actually a tracer wire we clamp on right here and we have this thing on all the way up to 10 this is the receiver so we just turn this on and it's got a little gauge right there and you start to hear the tone and the closer that you get the Lou it is so I wanted to show you guys come on over here Paul I wanted to show you guys you can do this on your own you just got to buy one of these this is the tempo works pretty good I think I got it on Amazon I'll put it in the links in the description but when you move out of the way the tone goes away and then watch this when I drop down there we go you can see the tone gets louder watch that's where our gas line is so we're going to be super careful digging right here if you are doing underground panel upgrades you got to have one of these on one of the projects that we did we hit a gas line it's cuz we didn't have a tracer with us and the fire department showed up the police showed up the city showed up and the last ones to show up was actually the utility company so we were sitting there for about an hour just waiting for everybody to show up so you got to make sure you get a tracer so that you're not hitting gas lines cuz it's not fun let me know in the comments if any of you guys have hit a gas line ever but just remember you still need to call 811 get them out here to locate but then this is super helpful when you're actually digging yourself to make sure that you can find the depth of the conduit as you're digging cuz sometimes they miss so if you have your own Tracer as well you can trace that wire that's wrapped around the gas pipe all the way out to wherever you're going"

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"VideoID": "444",

"Title": "Luxury Home Build Electrical Walkthrough",

"URL": "https://www.youtube.com/watch?v=I59LPo8zgRA",

"Keyword": "Electrical construction techniques",

"Transcript": "what's up guys I'm Bill Ryman with RK Ryman construction and today we're going over electrical walkthrough I've done one of these videos in the past but I wanted to get a little bit more detailed with it so what we're actually doing is we got our full team here the whole RK Ryman team we also got the electrician here we got The Decorator here we got jkm lighting design so they're lighting design company that we partnered with and we also have the low voltage company here as well so a lot of people involved in this process to make sure the lighting is perfect we actually go room to room look at every single detail on electrical whether it's Outlets uh C uh recess lights um any kind of lighting fixtures LED tray lighting anything like that we go detail by detail and make sure everything is there to exactly what the customer wants to how the dimmers are uh so everything is very specific to them and for them as well so these houses are very custom that we do and that's what we like to do at arcade Ryman construction especially building luxury like this so with that being said I'll see you guys on the next one get some pictures of my cute little hairo today cuz I'm like looks so girly in it looks very nice isn't it so [Music] girly CH Swang and it cost a lot always and you are not bad keep on going to [Music] right in the middle of this beautiful the I had to do I'm off for fifth I'm now I bought a w i paint paint it drive you think yeah Rich now hey little mama yeah you heard about me I'mma pop you like a pee yeah at a momy yeah feel so hard like I'm chilling on the beach yeah baby in the sun like the T be B off y chain swanging"

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"VideoID": "445",

"Title": "How We Built A Luxury House: A Step-by-Step Construction Guide | Cinematic Construction Video",

"URL": "https://www.youtube.com/watch?v=eM1L7zyZtCo",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] [Music] [Music] welcome to the journey of building a dream home in this video we'll take you through the entire process from laying the foundations to the final finishing touches my they told me that life is simple pimp IED out in R the presal speak once and listen twice they told me that less is simple I'm a serving in the room I'll be flying all on the wall open mouth conversations I leave you all in some all cutting through the [Music] our journey begins with the foundation it serves three main purposes bearing the weight of the house holding the house in place and waterproofing the property steel reinforcements are carefully positioned to provide the necessary strength to the foundation [Music] [Music] [Music] concrete is then poured into these trenches forming the strip footings of the home [Music] a dumpy level is used to ensure that everything is perfectly level a crucial step in making sure the foundation is stable and secure the first bit of brick laying occurs at this point with Foundation walls being built to retain the soil and support the floor slab [Music] next the foundation is filled with proper materials and compacted to meet required standards this ensures the structure is well supported and ready for the next [Music] stage before the slab poured the necessary Electrical Plumbing and gas pipes are [Music] installed a plastic membrane is led to waterproof the surface and prevent any moisture from seeping Up From Below measure enforcement is installed to strengthen the slab reducing the likelihood of cracks ensuring a long lasting and durable Foundation [Music] with the foundation in place we move to the super structure this is the stage at which the home starts to take shape the walls are built in three stages the first layer up to the hip level then to the top of the door and finally to the wall plate this allows the wall to dry and strengthen enabling it to support its own weight throughout the process break ladder reinforcements are added in the bedding providing extra strength to the walls [Music] the electricians and plumbers cut tunnels into the wall installing the service pipes that will house the wiring as well as the reticulated water throughout the structure [Music] the construction of the first floor slab is a complex process we set up steel supporting frames including standards ledgers gers and Runners formwork is used to hold the structure in place as we prepare for the concrete Pole [Music] [Music] [Music] steel reinforcements are delivered on side to be fixed together this includes the steel balls for both the beams and the slab service pipes much like those found in the foundation for electrical and plumbing are ran in between the steel reinforcements Precision is crucial because they will be caed into place the wrong light and plumbing PL bement will result in breakage further along the building [Music] process go [Music] [Music] all right so to all right [Music] okay pouring the concrete is a very critical step to relief pressure beams are ped first followed by the [Music] [Music] slab portable vibrators are used to ensure the concrete settles correctly and pockets are eliminated time is of the essence here as the concrete SS very quickly [Music] 2 3 [Music] 4 you're so fine oh lady let your body take [Music] control you're on my mind m baby just move a little closer and I say oh it's the night we both remember oh sweet surender oh we're moving close together want to make your body M for the night and S through the night once the slab is complete the walls of the first floor are builds just like those on the ground floor let's get out fast and slow I want to get to know you I know a place where we can go it's just around the [Music] corner and I say [Music] oh attention to detail is crucial po workmanship at this stage can compromise the entire structure as Frank Lloyd R once said you can use an eraser on the drafting table or a sledgehammer on the construction side [Music] oh sweet surrender oh we're moving close together want to make your body M through the night [Music] oh oh [Music] [Music] [Music] the timber roof trusses treated for longevity are engineered for quick assembly these trusses are methodically laid out and installed providing a framework for the insulation and roof sheeting to follow as the roof takes shape pling begins using a unique technique for a smooth finish sh [Music] the cement screeding is done to create a level base for the flooring preparing the home for its final layers [Music] the base of what will be the puggle in the backyard as well as as the screening for the shop front is a steel frame made of large eye beams these are carefully fixed and welded onto the super structure [Music] [Music] I [Music] remember when we used to be in love and we thought that nothing nothing could ever keep keep us from party leaving this romance behind but now you're gone and all I have is all I have this time and though you're not here anymore I still think about you on completion of the plaster work we used wood framing for the ceiling structure a cost effective and efficient method we dro the ceiling in parts of the home to create a space concealing the wiring for the home automation as well as the LED lighting [Music] drifting so Farr and I know we [Music] made I saw you walking and talking with another guy and I wish you happy sometimes I wonder why why have to all this time you're still on my mind cuz baby yeah I didn't forget [Music] you I didn't forget [Music] youy aluminum frames for Windows and stored at the stage fix it securely to the walls quality control is done for plumbness and [Music] straightness electrical wiring for lighting plugs and automation is carefully placed concealed within the ceiling frame and pipes inside the [Music] wall I'll never forget you baby [Music] oh I'll never forget you baby [Applause] oh I'll never forget [Music] you oh I'll never for get you baby I never [Music] [Music] this soil around the home is filled and compacted for two reasons the first is to shape the land for storm waterotor drainage the second is to prepare it for pavement and Landscaping [Music] preparation is key for painting a cement Prime is applied to ensure the true color of the paint is vibrant and long-lasting it's also used to seal the plaster protecting it from the elements [Music] for the floors we chose large marble style porcelain tiles adding a touch of luxury to the home we wanted a light High loss pattern to bounce lad around throughout the home visually expanding the space [Music] [Music] [Music] [Music] [Music] for the exterior we went through multiple paint samples before deciding on a dark and Moody theme a blend of dark charcoal and lighter gray tones [Music] the result is a striking bold structure that looks anchored within its landscape [Music] [Music] [Music] one of the key design features of this home is the custom staircase designed by forier a Sleek steel column serves as the spine emphasizing the clean vertical and horizontal lines that def find the home's aesthetic [Music] [Music] [Music] in my dreams I'm never over you just trying to stay alive frameless glass folding doors were installed in the living areas creating a seamless connection between the indoor and outdoor spaces specially glazed and tempered laws was used to provide strength and durability with a unique track for seamless use the flush glazing used along the shop front ensures unobstructed views enhancing the home's open and modern feel it feels all [Music] right guess it's nothing left for me to do hi do the tears tonight I remember when I laid my eyes on you I know you would never be we balanced the this bold modern look with natural stone cladding in Grays blacks and Browns adding texture and warmth to the design the linear shape of the stone cladding serves as an introduction for the vertical and horizontal lines I am lying to myself because I need some [Music] time it's a process I am in y and I will walk the line and I'm just here there's something until there's something new yeah Al it feels so although it feels so nothing for me there nothing left for me to do back to [Music] the conclusion of the finishes is marked by the start of the carpentry enginery the kitchen designed in collaboration with our interior design studio continues the H's Dark theme granite countertops were sourced to MCH the aesthetic of the [Music] home the Stars convey the light so fragile in the night skilled installers cut and fit all the counter tops and kick plates two size forever be in this moment in this moment forever be [Music] forever night face like a whisper song As Time Rush s oh it won't belong fading now until [Music] this point is perhaps the most exciting part of the project this is where we have the opportunity at for to create all the fittings and fixtures from the lights and facets to the bathrooms and dressing rooms this is where the house truly turns into a home in this moment forever be forever [Music] be be [Music] be be [Music] at moani Property Group and for we proud ourselves on quality craftsmanship and attention to detail creating homes that are as beautiful as they are durable if you're in buan prur in Johannesburg let us help you build your dream home to see the completed tour of the finished home we have a full video showing every detail of this beautiful house click on the video card at the end or check the description below don't forget to subscribe and share with others till next time beos truly the team at BM Studio [Music]"

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"VideoID": "446",

"Title": "Technique Of Placing Concrete Images On The Wall || Rajiv construction",

"URL": "https://www.youtube.com/watch?v=h9bE8Jq0Diw",

"Keyword": "Electrical construction techniques",

"Transcript": "a oh a he he he he he n n oh n"

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{

"VideoID": "448",

"Title": "NEW Camp Nou Construction Update (16 September 2024)",

"URL": "https://www.youtube.com/watch?v=B42F703u-MI",

"Keyword": "Electrical construction techniques",

"Transcript": "[Music] the Redevelopment of Camp new is progressing steadily with significant strides made in various areas of the Stadium's overhaul work on the existing tribunes is a key focus at this stage particularly in the reinforced coating of the stairs a vital structural element that will support the installation of new seating this reinforcement is crucial for ensuring the state medium can handle the increased capacity while maintaining safety standards the design not only aims to expand seating but also to enhance visibility and comfort for spectators substantial efforts are being made at the entrances and exits of the tribunes these access points are being upgraded to allow for a smoother flow of fans improving the overall Match Day experience and ensuring compliance with modern safety regulations this work is proceeded in at a rapid Pace showcasing the club's commitment to delivering a stadium that meets the expectations of both supporters and international visitors the installation and reinforcement of the entire structure of the third level of the Tribune are advancing rapidly marking significant progress in the Stadium's Redevelopment in several sections work has already begun on installing The Terraces that connect the second and third levels a key feature designed to enhance the Stadium's overall capacity and spectator experience these Terraces will not only provide additional seating but also improve the flow of people between the levels making movement easier during matches and events furthermore attention is being given to the installation of decorative and Architectural elements that will give the third level its distinctive look these design features are an important part of maintaining the Stadium's aesthetic appeal while ensuring that the new SE s blend seamlessly with the existing structure decorative elements such as facades cladding and railings are being carefully installed to uphold the iconic appearance of Camp new while bringing a modern contemporary touch in terms of safety and structural Integrity the strengthening of the third level is crucial engineers and construction teams are using Advanced Techniques and materials to ensure the new levels can support the increased capacity while complying with the highest safety standards this phase of construction involves reinforcing beams pillars and staircases all of which are essential for maintaining stability as the stadium grows in size and complexity the fast paace of this work suggests that the renovation is on track and as the third level begins to take shape it signals a major step forward in the overall project once completed the expanded third level will offer improved visibility and comfort for fans making the new camp new a world-class venue that retains its historic significance while embracing modernity in other parts of the stadium such as the underground and parking levels the construction continues to be among the most intricate and challenging aspects of the entire renovation these areas are vital to the overall functionality of the new camp new yet they require a high level of engineering precision and planning due to the complexities involved in working beneath the massive structure of the stadium the underground levels house essential infrastructure including Utility Systems electrical wiring water management and ventilation all of which are critical for the day-to-day operation of the stadium constructing and modernizing these systems while ensuring they can support the increased capacity and demands of the renovated Stadium adds an extra layer of difficulty Engineers are carefully coordinating the installation of these systems to guarantee optimal efficiency and safety while also future proofing the stadium to accommodate technological advancements for years to come the parking levels an essential feature for accommodating the thousands of visitors who will attend matches and events present their own set of challenges not only must they be expanded to meet the needs of the increased number of fans but they also need to incorporate modern features such as electric vehicle charging stations improved security systems and easy access routes that integrate seamlessly with the rest of the Stadium's infrastructure designing a parking system that is both efficient and able to handle large crowds during peak times requires a combination of strategic planning and cuttingedge Technology subscribe now and be a part of our Stadium loving family hit that notification Bell so you never miss an update and be the first to explore the secrets stories and history behind these colossal structures"

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"VideoID": "450",

"Title": "Electrical Wiring For Lights (House Wiring Made Easier)",

"URL": "https://www.youtube.com/watch?v=2tdN85reWN0",

"Keyword": "Electrical wiring installation",

"Transcript": "when we get to wiring the important tools for wiring are number one the pliers the side cutter as well as the steel tape or the draw wire my good Nigerian friends call it the Fisher another important tool is the insulating tape so to start this wiring I will begin with the lighting so I will make sure that I insert the draw wire at the consumer unit and get it at the first junction box or the first circular box where from there now I will Loop my steel tape to other boxes at this first junction box I will require an earth connection the face connection or the live connection as well as the neutral and all of that will also go to feed other places here then from here I will now connect connect my face to this box as well as this box as well as this box and also the other half for the lights so I will connect it at this point all the way and there I have it and then I will still extend it there and then now from there I will also so extend it all the way there now for the wiring of the lights Network I will require the neutral at 1.5 I require the life at 1.5 as well as the Earth at 1.5 because all of these wires are common from here to here all the way to the consumer unit I will now have them drawn all the way to the consumer unit so so basically I just attach them to my draw wire just like that and then as I said the tape insulating tape is important in this case just to ensure that the wires do not lag when I am pulling them so this is the point whereby you must have an assistant when you're doing these wiring so that as you push the wire through the conduit there there is someone at the far end who is pulling like that so you are just there assuming this is the H kitchen you will need the wires assuming this is the sitting room and this is the restroom uh we are doing that connection all the way to the consumer unit and there we have it at the consumer unit remember I said it is important to give an allowance at the consumer unit to allow for future repair Works in case there will be repairs probably these wires will be reduced will be cut over time so once you have a good allowance then uh it will be very good for future repair works this is our lighting wires where we have the face the neutral and the Earth connection dropping at the consumer unit like that and then at this first junction box now uh we give that allowance where we'll have the loop so we will not even cut it and again at the second H connection there we will leave it at that and then here we leave it at that in the meantime that because that is wiring we will not cut we leave it them like that so at each and every switch here for this light we require one wire that connects the live or the face and another one that goes to the bulb holder or the light switch and that is all and these wires are red so they will be connected here and then get out so one wire will be connected to the face and another wire will be connected to the the light source so at this particular point we will need to Mark which one is the one that is connected to the live wire so that it is possible to identify so now that is that one we just have to mark it in a way for me I will have to mark it like so just uh a pinch indicate that this is a light connection and the other one I will leave it like so so this one I will connect it to the light source this one I will simply uh connect it like so it is going directly to the consumer so uh I will have to Loop it uh when I will be doing fittings the neutral will go direct to the light source as well as the Earth connection so and then here is where I will fit my switch and when we'll come to fittings I will demonstrate this together with the fitting of our light source so for the other two switches the procedure is the same connecting two wires to the light sauce and having to mark them now if you have understood that concept smash that like button so that I know that you are at par now in this video I am doing the wiring for an instant shower head it is important for you to take note especially of the size of the wire because this is a sensitive installation in the house subscribe to this channel so that you won't miss that important [Music] episode"

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"VideoID": "452",

"Title": "Home Electrical Wiring Basics - Tutorial (2022)",

"URL": "https://www.youtube.com/watch?v=KnqMJeNN1ug",

"Keyword": "Electrical wiring installation",

"Transcript": "hey guys in today's video we're going to be working on basic electrical wiring if you want to install a smart switch or you've ever wanted to change your regular switch or a dimmer switch or if you wanted to install a gfi outlet in your kitchen or a regular change your outlets or install a smart outlet or a usb outlet stay tuned to this video i'll show you exactly how to do it [Music] all right guys welcome back to another episode of donate yourself first of all let me start off by saying that i'm not a licensed electrician but i have accumulated electrical knowledge over the years and if you are not sure about what you're doing then please consult a licensed electrician for help all right now that we got that out of the way let me first start by going over some common terms that we're going to be using when talking about electrical wiring these are line hot load neutral and ground these are the terms that you guys are going to need to be familiar with when you're working with electrical wiring i'm going to be using a switch for reference but whether you have a switch or an outlet the first thing you want to do is remove the cover plate you can see here these are held in place by two screws you're going to want to remove your cover plate and then you're going to want to remove the actual switch usually it's held in place by screws here and here you're going to remove it once you remove it there'll be wires connected all to the back here but we'll go over that in a second and you're going to have cables in the back of your box all right don't panic i know it seems like a lot of cables but i'm going to show you what all the cables do and what wire does what all right now that we have our box the next thing we're going to do is we want to find our cables the first wire that we need to locate is called the line wire this is usually black in color and line or hot sometimes you'll hear it referred to as hot is the term used for the power cable here in the us that's 120 volts but in your country the voltage may vary either way this wire here is the most important wire you need to be aware of because this one carries all the power the load is usually represented by a red wire the red wire or the load is usually the device that is getting powered so this wire would typically go to either um a light bulb or a fan or any other device that you're trying to control the neutral wire is the second part of the power cable that returns any excess voltage back to the panel in most cases the voltage in the neutral cable will be zero volts and usually the neutral is represented by a white wire all right the next wire is the ground and the ground wire is usually typically either copper like this or in some cases it may be green but the ground refers to the cable that protects the circuit from any surges is in electricity in most cases again the voltage in this wire is going to be zero as well okay so now let's talk about switches whether you guys are installing a smart switch like this one or you want to install a dimmer switch like this that dims your lights up and down or you want to just install or upgrade your existing light switch then they're all function the same switches are simple the way it works is just imagine power comes into your light switch from your panel and then the switch sends the power to whatever device you're trying to control so when you turn it on it sends the power to your light switch or whatever device whenever you turn it off it turns the power off so whenever you're wiring any light switch you want to find four things you want to identify the hot wire which is carrying the power the ground wire the neutral wire and we need to identify the load the device that is being controlled all right and the way you identify them is with a multimeter or a circuit tester in order to identify these devices you can either use a circuit tester like this or a digital multimeter like this once you've identified once you've identified which wire is which one then you can turn the power off and begin the replacement of your switches i know some of you guys don't know how to use these testers but these circuit testers are pretty easy what you would do is you would touch it to each wire and it would beep if it has voltage in it so in the case of a switch you would look for your white wire and if you touch it to it it should have zero so you know that you're neutral your copper wire is always your ground wire and you need to look for your black wires and your red wires if you touch it to your black wire and it has power and you turn off the switch and it still has power then that is your hot wire or your power wire coming in if you touch it to your red wire and turn the switch off and it doesn't beep that means there's no voltage you turn it back on it beeps that means there's voltage which means that's your load wire going to your device all right so now that you've identified that using this you can also use your multimeter the way the multimeter works is if you take you're going to have two leads here one is your black lead one is your red lead you can touch the black lead to any grounding device in your box either a screw on the box or if you flip the switch over and you see the grounding screw or the copper wire you just hold this on the copper wire and then you touch the red wire the red lead to either prongs or other wires in the circuit if you touch it to the white wire and you get zero volts you know that that's your neutral if you touch it to the black wire and you get 120 volts then that's your power wire then you turn the switch off if you still get 120 volts then that's your power wire or your hot wire and then you touch it to the red wire or if there's another black wire in the box you touch it to that wire and turn the switch on and off and if the power goes between 0 and 120 volts then that's your load wire and that's the way you identify using a multimeter so as i said before all the switches have the same four wires that you're going to look for okay let's take a look at a smart switch first as you can see here we have four wires like i said the green one is your ground the white one is your neutral and in this case any one of these can be either your hot wire or your load wire so what we would do is inside of our box we would look to find all the corresponding wires we would take the ground wire like you see here coming from inside the box and we would connect it to the grounding wire here using wire nuts then we would connect the white wire here on the switch to the white wire here in our box then we would connect the black wire here on our switch to the black wire here and the load wire which would be going to our light our light bulb which would be the red wire here to the other to the load terminal here and that's how you'd wire a smart switch the same token you would have a dimmer switch the dimmer switch works the same way again in this case we have a green wire which would go to our ground here we would have we have a black wire either one of these wires can be connected to the hot and to the load so we will connect one to our black wire and one to our red wire and the white wire that's left which is the neutral would just be connected to the other white wires that are inside your box so if you see a box if you so if when you open your box you see a bunch of white wires connected together don't panic just connect the other white wire to that bunch of white wires as well and that takes care of your dimmer switch now if you have a regular light switch then you would do the same thing again you look for your ground and on here the ground in screw is located right here so we connect our ground to this screw here our hot to this screw here and our load which will be the red wire to the other screw here and again the white wire we would just connect them to all the other white wires in the box if you notice on some of these if you notice on some of these switches you have holes located here and here that's to make the installation simple in some cases you would just take a pair of wire strippers strip the wire and you would loosen these screws here and here and you could just push and then you just push the wires in and tighten the screws if it doesn't have holes usually you have to bend it around the screws here and all you do if it doesn't have screws sometimes you have to bend the wire and form it in a little hook like this and then you hook it you unscrew the screw hook it around the screw and tighten the screw okay now let's take a look at outlets it doesn't matter if it's a smart outlet if it's a gfi outlet for your kitchen or if it's a standard electrical outlet again just like switches they're all wired the same however unlike switches outlets only require three connections they only require the hot the neutral and the ground why because the outlet doesn't have a device that it needs to control the outlet is the device so just like the switches we need to locate the hot the ground and the neutral wire and for outlets it should be pretty simple i'll show you guys a trick how it works with outlets usually if you see an electrical outlet you always notice that you have one side that's small one side that's larger and one size here for a circular insert the way it works is this side is the smaller side is typically your hot side which is where the power is that side is your neutral side and that side is your ground so so if you look at an outlet and you remove it from the wall and you flip it over the side that's connected on this side is typically your hot side and usually the screws on that side are usually copper color or black the other side is your neutral side and if you see here the screws are typically silver which is for your white wire and then usually down at the bottom you have a grounding screw here so usually outlets are pretty easy to um identify what wire goes where once you remove them however if you're not sure you can still test it with a circuit tester again once you remove the once you remove the outlet from your box if you have your box here and you remove it and you want to put in a new one you would put the ground in screw the grounding cable would be attached to this screw here and you would just tighten it the white wire would go to here on the any one of these screws and you would just tighten it and the black wire would go on any one of these screws here and then you would just tighten it in this case it doesn't have any push pins for it to any push holes for it to go in the back so you actually have to tighten it around the screws here but that takes care of your standard outlet now a usb outlet or any other smart outlet is the same thing we want to find the hot the ground and the neutral and that's it so like i said if you look at it if you look at the outlet here you can see this pin is usually you can see this screw is silver which means it tells me that this should be our uh neutral side and if you flip it over look this side is bigger which is our neutral side on the opposite side here we have a copper color which is going to tell me that our hot should be connected here this is smaller and we should have a grounding screw here we go our grounding screw is somewhere down here okay this one has push pins where you can slide it in it doesn't matter which hole it goes into as long as you connect the neutral on this side which is the white wire and the hot wire on this side and if you notice here they made it a lot simpler and a lot easier by labeling it it tells you here on this side it says hot and on this side it says white you may also notice that a lot of these switches come with this measurement here that's for the wire so you know how much wire to strip away so that it will fit tightly and snug down into the holes you also have the ability to loosen these screws and just wrap the wire around it or slide it behind the plate and tighten the wire if you want but either way that's how you wire a usb um outlet gfi outlet this is for your kitchen or anywhere you have water it has a breaker built into it so that if there's a surge in electricity or the amp inc amperage increases then this is a protection for your circuit again what do we identify when we're changing switches we want to find the hot the ground and the neutral and again the hot should be on this side and the neutral should be on this side so let's take a look as you can see the screw here is copper colored for hot and the screw on this side is silver for neutral again you have holes that you can push the wires in and once you have those connected then your switch is i mean once you have those connected then your outlet is done if you notice here on the top you have um more connectors and it's usually taped off what this is is in the event that you're wiring multiple switches together then you would connect your connect your hot here connect your neutral here and then you would connect the wire from here to your other outlet and that connection leaving would become the hot wire and you would take that hot and put it into here on your on your second outlet and here would be the neutral on the second outlet so but for all intents and purposes we just want to find the neutral the hot and the ground and have those connected and we're done and that sums up how we want to install any switch and the wiring for any switch okay so now we want to recap for switches we look for four connections once we remove the switch and we have the cables exposed we look for our line our neutral our ground and our load cable then we find the corresponding cables on our switch and connect them to the corresponding cables in our box for our outlets once we remove the outlet or we have the box we want to locate the hot the neutral and the ground once we found those cables we're going to connect them to the corresponding terminals on our switch and remember the trick that we used the short side the terminals on that side are usually hot the bigger side the terminals on that side are usually the neutral and the ground is usually located on the bottom or on the top of our switch all right guys with that knowledge you guys should be able to wire any electrical outlet or switch that you come across stay tuned to some of my videos where i'll be actually installing some of these switches in my house or some of these outlets in my house so you guys can follow along if you guys are still nervous about installing one of these in your home thank you guys so much for tuning in to the channel and i hope to catch you guys in the next video thanks a lot and i'll see you soon i hope you guys found this video informative and if you did please hit that like button hit the subscribe button and leave a comment in the comment section below thank you guys for watching so much and hopefully i'll see you in the next video you"

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"VideoID": "454",

"Title": "How to Wire a GFCI Outlet - What&#39;s Line vs Load? - Electrical Wiring 101",

"URL": "https://www.youtube.com/watch?v=Uop79H\_iqoQ",

"Keyword": "Electrical wiring installation",

"Transcript": "hey everyone mark from top homeowner and today we're going to talk about gfci outlets now if you have to install a gfci outlet or if you need to replace one that's broken this video is going to cover the basics that you need to get the job done in either case um real quick just to show you what a gfci outlet or actually it's really called a receptacle what this looks like is this it's kind of like a big block a rectangle this is a normal receptacle you can tell it's quite a bit different and the reason for that is this has electronics inside of it in case there's any kind of electrical ground fault so basically electricity flowing where it's not supposed to typically these are found in locations that are wet like bathrooms and they can be found in other areas too depending on what your local codes are for the most part installing one of these is just about the same as a normal receptacle but there are a couple key differences that you need to be aware of a big difference between this type of a receptacle and a normal one is there's actually a load and a line input on this input and output so i'll talk about that when we get into the basics of wiring one of these up one other quick thing to note about these is not only can they protect the location where they're actually installed but they can protect the entire circuit that follows this receptacle so if you have an outlet that's powered after this one uh through the electrical wiring that it will actually protect that as well so uh we'll talk a little bit about that uh when we get into the wiring portion but i just want you to be aware if you ever have a receptacle in your house that's not working and you can't figure out why the breaker seems fine but you just have a receptacle that isn't working for some reason it could be because it's powered off of a gfci receptacle and you might want to check for that if you have a gfci especially in a bathroom area make sure these aren't tripped because if they are and you have another receptacle that's powered off of this one it's going to protect that too and so that one's not going to have power so just a quick little tip as a couple different ways that these can be used for so the big difference between this and a regular receptacle is on the back here you've got a couple different terminals right here on a normal receptacle let me get one out for you you kind of looks like you have the same thing right you've got two terminals on this side you've got two terminals on this side and you've got the same thing here but it's a little bit different on a gfci outlet um you actually have these two markings these two indicators right here it says load and this one says line now the difference is on one of these compared to this on this it doesn't matter which of these terminals you use like at the top or bottom obviously you need to make sure you're only hooking up your hot wire to the hot side and the neutral wire to the neutral side but when it comes to actually hooking up the wire line means on the gfci receptacles that this is the power coming from the panel the electrical panel that's in your house load is any additional outlets or receptacles that are powered off of this one as you can see here in this diagram this is a representation of what this looks like in practice you can see the breaker panel here and then it connects to uh with the line to the gfci receptacle and then you have your next receptacle that's daisy chained or connected off of that so that's what this kind of looks like in practice so obviously you want to make sure that you get this correct you can use a no contact voltage tester to test and see where the power is coming into the electrical box if you're installing one of these where it's not already installed meaning if you're replacing a regular receptacle with a gfci receptacle then you're going to have to make sure you identify which wires are coming from the panel if you're replacing a dfci receptacle then it's a little bit easier to identify because you'll know that the wires going into the line terminals on the old gfci receptacle are the same ones that you need to hook up in the line terminals on the new one you have also have a couple options here when it comes to installing wire you can either use side wiring which is wrapping a wire around this screw and that looks like this with a nice j hook here you can hook this onto this terminal and then you can tighten this connection down and that gives you a nice tight connection just make sure that this loop is pointing the end of this loop is pointing to the right because when you tighten it down you want to make sure that it tightens the loop down and it doesn't unwind the loop if it's the end of the loop is pointed to the left then it's going to want to unravel the loop if it's pointed to the right it's going to tighten it down with the screw the other option you have when wiring these is to use the back wiring method now the back wiring method can be a little bit controversial um and let me explain a little bit why that is on a standard receptacle this is a residential grade receptacle uh back wiring simply is these uh little openings here these little circles these holes and what you do is you basically stick a wire down inside these holes and the reason why these are here is because it makes wiring really fast for an electrician especially on new construction jobs they can get a lot more receptacles wired in home a lot quicker by using this method it's not the preferred method when it comes to a good solid connection preferred method on these is to use the side wiring method which is using the standard hook on the side that's going to give you the best connection here but there is another option for back wiring that is actually okay and in some cases is preferred with a back wiring option with a gfci outlet or receptacle and with commercial grade receptacles back wiring action is actually done with a clamp a compression clamp so what happens is you can stick the end of the wire in this channel in the back here and what what you do then is you'll tighten the screw down and that screw will clamp down on the wire this is actually just a fine method of installing a receptacle and the reason for that is is because you are taking the full weight of the screw the full pressure of the screw and tightening it down on the copper with the residential grade receptacle um you're not using the screw in this case to to clamp down on the wire you're just using the pressure of a little clip inside so with this one you're actually using the full pressure of the screw and this is just fine and actually it's a lot easier to install because you don't have to make the hook you just need to strip off the wire and put this in the hole now when you do strip off wire you want to make sure that it's not too long i'm going to show you if i stick this in here um i i've gone as far as i can go inside of this uh buying this clamp here and uh there's still copper that's exposed that's going past the edge of this receptacle so that's too long with this what we would need to do is we would need to trim the end of this off to get it a little bit shorter so that way it seats in and the insulation is protecting it if too much is exposed then we're going to risk having a short inside the electrical box which is really bad and here's an example with a shorter wire and actually this is the correct wire for this terminal because this is the hot side and then this is a black wire so if i stick this in here you can see um there's copper all the way behind this uh the clamp there and then the insulation is protecting it all the way down to about here so this is just fine you can install it here tighten it down and everything will be okay now while this isn't actually inside of an electrical box i will show you the process of what it looks like to install this if it was in place when it comes to the wiring so again you've got the brass terminal which goes with the hot wire so you would stick that in here make sure it's down nice and tight and then tighten this down with a screwdriver the silver terminal is going to be for your neutral line or your white wire slide that down and then your ground wire is going to go right in here now if you do have a wire that's got a green insulation on it you'll want to make sure that the green insulation is above this clamping point because if it's not above the clamp point then you're going to have a bad connection here behind this this clamp okay so that's what it looks like if you just had a receptacle coming in and it was not powering any other receptacles in the circuit this would all come into the line here you've got black to brass you've got white to neutral and then you've got your bare wire to the ground okay another way to tell which side is hot and which side is neutral is the small side on the the front is always going to be the small slots always going to be hot and the wide slot is always going to be your neutral that's about all there is to it hopefully you found this video helpful if you did i appreciate you subscribing to the top homeowner channel where our goal is to help you become the best homeowner that you can possibly be we cover everything from product reviews to home improvement tips and tricks and even some remodeling videos so you want to be sure to stay tuned and not miss any of the videos that we have planned alright thanks again for watching and we will catch you in the next video"

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"VideoID": "455",

"Title": "Electrical Wiring At The Meter Box (DIY Version)",

"URL": "https://www.youtube.com/watch?v=lH1pchxXFFs",

"Keyword": "Electrical wiring installation",

"Transcript": "Welcome to our today's video where we are talking about the meter box the meter box is very important when it comes to any electrical installation because you know what here is where the power will drop and finally be distributed to the system either in the house or the electrical system in any installation so welcome let us Dive Right In and discuss a thing or two that is very important when it comes to these meter BS there are some devices that we need to have here number one we have the cutout now this is a cutout what I have here is a double cutout why am I referring to it as a double cutout it has the neutral section and it has the face where we also have this fuse and this is a fuse carrier and there's a fuse inside now the first will come through here the neutral will be connected here and we'll have the output here as well as here now another thing that we'll have in this meter box is definitely this double pole switch or DP MCB the double pole miniature circuit breaker this will help in case there is an issue to do with over current or probably to switch off electricity in the house in a simple manner another thing is definitely the energy meter I am using this one just for demonstration purposes I understand there are token meters which are currently in use then we have the cables so we have this cable this is a 16 mm Square cable it is a drop cable it has the connection for the neutral as well as the life we will strip it to expose and show how it looks inside we also have the mains that connect our consumer unit to our meter box this meanss are not less than 10 mm Square so that is what we require another thing very important is the athing consideration I have this bolt and nuts here and also the washers where I will be showing you how to connect the athing in this meter box in a short way so we'll first start with the first things first and have the double cut out here they open that can screw that so we have have is casing here for a and the output for neutral the input for neutral is here and uh here we'll have the face so we simply have to expose that and so using this screws we have it here this main switch which will be here last but not least we'll have our energy meter here from the energy meter we will get the output to go go to the consumer unit now on that we will require to have our cables coming in where the caes will come in through here exit to this main switch and at this main switch we will now connect them all the way to feed the energy meter and the output will go to the consumer unit all right when getting this cable from the pole it is important to ensure that you give it an allowance because there's plenty of room in this meter box why because in future there could be an issue such as aing which may melt the insulation and you require to cut these cable so that you can expose the other cable that doesn't have an issue so for that reason we create some more room here can even fold it before it goes all the way into the cutout so we'll simply strip it notice my stripping tool here doesn't have any connections so once I cut it I expose that and all I need to do is to simply pull it out so that is the cable and then I will take these so this is our neutral connection and this is our face remember this is all we require at the meter box the neutral connection connected at the pole coming in with this drop cable and this is the face so we also strip it and there we have it so we have our face connection here and this is the neutral now what we need to do is to tape it from here with a tap all the way here just to balance these TR here ensure that they are the same level use our black tape here so with this black tape I will simply ensure that I tape it as a way of insulation that gives us a good insulation all the way from here using my tipe so this is what I will do in a simple way do the same or repeat that procedure backwards just to strengthen you know my tape like so the face going all in and for our neutral the same case so that is how they are connected we ensure that the cables go all in especially for our face connection and even for our neutral is all in that Kai that that's it so we will wire this double pole switch to our double cutout have our wires here connecting this double cutout to this double pole switch let us talk about the Earth connection the Earth connection now will be tapped from here and it will go all the way to the consumer unit also it will be connected to the meter box surface because it's metallic and the other part will go all the way to the Earth Road this Earth connection I will tap it from here so that is is how the connection is made that is bonded the neutral and the Earth connection are connected there like so and we go ahead and screw it now for the first connection we will connect it at this other part here of our cut out to go all the way here fold it like so now I will be having this meter here for this type of meter I have a connection here where I need to input the face here and the output of the face here at this first lot on this other lot it's reserved for the neutral connection where the incoming neutral is connected here and screwed at this point and the outgoing screwed here which goes to the consumer unit so let us have it here so I have to ensure I do a tight connection the same app to my neutral cable this one note note that the size of the cable matters a lot the cable that I'm using here is 10 and you shouldn't go below that but you may go higher but not below than 10 mm square that is the CR C area all right now having wired that connection last but not least very important is now to bring in the cables the main cables from our consumer unit and we will fix them here now we are going to also do the connection for a very very important so again as we said we would wish to have our cables coming all the way from below so that is why we have our face and our neutral and the Earth from the consumer unit coming all the way from below so that we do not have issues to do with r fall now let me connect these face and neutral first so that will be done with the meter connection before we can finally conclude on the earth connection which is very very important now for these cables that are going to the consumer unit we will simply connect them to our energy meter here so like I had say this is the incoming pH and the outgoing live connection will be connected here now this connection is going to the consumer unit so the output is connected here so in this type of meter that is how the connection is you need to ensure that you do the correct connection when it comes to your type of meter that you are wiring so you ensure that the wire goes all in but you do not screw on the insulation very important because if you screw on the insulation it will mean there will be a problem with the way that the electricity will be flowing because if you screw on the insulation then it will mean that there will be a strain now for this here we will then connect it here at that output now we need to connect the Earth connection the last connection but not the least then you simply cover there and screw it we'll simply have these one C covering here and finally screw it here make sure that it is tightly done from our cutouts and we have this cable going to our consumer unit we have to strip them a thing is wired in this this manner from the cutout at the output of the neutral we will tap our athing here so we have our a thing here and this other a thing is coming from the consumer unit but we still need to Earth our wire all the way to the Earth road that is just below our meter box so bringing in that wire we have it here look at how I have allowed them to be as long as possible so we have three Earth wires from the consumer unit from the neutral here and from the earth road is located just below the meter box so I will strip it now these three wires will be interconnected and then when I have done a very good connection I will then connect them at my meter my meter board is metallic and anything electrical that is metallic has to be add so that is how we are going to add it now Things become very interesting I have drilled a hole there on my metallic meter box and then attached all of those wires on these nut they'll have to go there and then I will bolt them so that they are in contact with the metallic meter box there so that is basically our athing completed there as well as the entire meter box [Music] wiring [Music] a"

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"VideoID": "456",

"Title": "DIY Electrical Wiring! Fast, Safe Home Wiring Basics for Switches and Outlets",

"URL": "https://www.youtube.com/watch?v=ocj\_kdHv1\_I",

"Keyword": "Electrical wiring installation",

"Transcript": "i think wiring is one of those trades that scares most people and safe wiring is all about good connections a loose connection it doesn't only interrupt power but it can also cause a fire hazard because you're creating a place that it can arc so this video is going to be about how to make those safe connections and the different options that you have available so the first step is to strip back the jacket around the romex and you typically want to do about eight inches they do make specialty tools but i either use the blade on the wire strippers themselves or i use a box blade and i just go in at an angle press into the jacket here you just want to make sure that you don't go through to the wires below take off the jacket strip back the cardboard and now you can strip your wires now note that there are different types of wiring they're solid like this and then they're stranded and on wire strippers some of them have a readout where they're different on either side such as this one says 18 on the left and 20 on the right these are size four solid if you're going to be going with stranded instead then you just go up one side so instead of going at 18 you would go to 16. for wire wire connections wire nuts are the go-to and the coloring is actually an indication of the size of wire and how many that they can receive and if you ever have any questions there's always a sizing chart on the side of the container to tell you what they go to now a lot of people think that whenever you have two or more wires you actually have to twist them together before using a wire nut but that's not true what you can do is cut them to be the same length just stab them in and then you want to keep twisting until there is a few twists here at the insulation then just good manners i always give each wire a tug to make sure it doesn't pop out of the of the wire nut now if you're making any sort of wiring connection in your house then every single one of these connections needs to be inside of a junction box that's code you can't get around it but if you're doing wiring outside like i was whenever i was doing my outdoor kitchen they do make direct berry wire nuts such as these and inside of these is a gel to where it will prevent moisture from being able to get in into the wire so these you can you can dig a trench make the connection and then just bury it directly in the ground so if you're going to be wiring something in your house such as replacing a light fixture more than likely the wiring in the wall is going to be solid and then the light fixture would have stranded like this so whenever you're making these connections a lot of times the stranded wire will want to pull out a way to prevent that is to take the strands of the stranded and divide it into half and now give it a good twist now put it up next to your solid wire but leave it about an eighth inch taller so that whenever you use your wire nut and stab it on like this the stranded wire will grab inside of that wire nut first again keep twisting until the two wires twist at the insulation level and then give it a nice tug to make sure both of them are in there correctly now if you're going to be working with stranded wire this is one area that i don't recommend using those push-in connectors they say that you can but i've just never had much luck with it real quick i want to thank this video sponsor which is trueville with the fresh new year comes a great opportunity to set some meaningful new year's resolutions for me one of my top resolutions is always considering my finances trubill is an all-in-one personal finance platform that helps you save more and spend less the personal finance manager allows you to manage subscriptions lower bills monitor your credit score and build your savings all in one place truebill has helped me better control my finances by safely and securely identifying reoccurring charges and cancelling unwanted subscriptions with just a tap it also helped lower my bills by negotiating them for me from internet service bills to credit card bills saving me both time and money another feature i love is that true bill can automatically monitor your spending by category send you friendly notifications when you've excited them and visualize your spend to earn ratio by month quarter or year with truville i'm looking forward to getting ahead and crossing a lot of financial to-do's off my list for 2022. to try it out for free you can head over to truville.com april or click the link in the video description so wire nuts are safe reliable and cheap but they're not my favorite my kind of go-to these days for anything electrical or these push-in connectors these come in a variety of different sizes from two inlets to six they are more expensive but i will tell you right now they will save you a ton of time the way that you use them is you strip back half an inch of insulation and then simply push them in now the important thing to note is that whenever you use these you want to make sure that the uh that it seats all the way you also want to make sure that you don't have any copper exposed on the bottom side outside of the pushing connector now if you need to get these off you simply can't pull them out which is a bonus to them so if you make a mistake or are disconnecting a connection twist it back and forth in order to get it taken off but on that sometimes whenever you're wiring a lot you're actually twisting and pulling so before pushing your wires into your junction box make sure that the copper is seated all the way on all of them then before you close up your your box something else to know is that even if you get a six push-in connector you don't have to fill every single slot you can leave some of these open all right let's move on to wiring in an outlet now a lot of outlets will actually come with push and connectors here on the back yes they work yes they're going to save you time however i've spoken to so many electricians that refuse to use them because they've seen so many problems with them i'm going to put that over there so i definitely recommend using the screw terminals on the side but nowadays you can get an outlet with a plate on the side that is almost just as easy instead of having to make a pigtail the correct direction around the screw lug on these that you can move the plate forward put in your exposed copper and then tighten down on the screw you want to make sure that you don't trip back too much insulation where your copper is hanging outside of the terminal but you also want to make sure that you have enough strips back that the entire stab in on the terminal is copper exposed now if you are going to be making a pigtail two go around the lug most wire strippers have holes here in the side to aid in making that loop where you can stab in your exposed end and then simply turn it into a loop then the last thing to note is the different coloring the gold side is always going to be going to your power your black then the silver side is always going to be going to your neutral which is going to be your white and then of course green will go to ground the last setting i want to cover before moving on there are tons of homes in the u.s that have aluminum wiring and if you if you have aluminum wire you can't connect copper to it aluminum copper expand and contract at different rates and so what will happen with heat and cooling the copper wire will actually slip out of the aluminum and then it could start a fire so if you have aluminum wiring you need to use these special connectors that will accept both copper or aluminum and they actually have a gel on the inside as well to prevent oxidation so just check to see if you have copper aluminum and know that there's a special fitting if you are one of the aluminum old homes okay and the last thing i'll leave you with is if you're going to be adding something to a circuit in your house you need to be choosing the correct gauge that is existing in your walls now if you have a newer home there's actually color coding now so that it's a visual indication on if it's 12 or 14. however it's if your house is 15 years or older there's a good chance that you just have cream color which doesn't give you any indication at all so a good way to test is 14 gauge wire is about the same thickness as the dime and 12 gauge wire is the same thickness as a nickel so you can just take some out strip it back lay it flat next to it and get a very quick indication on which wiring you need to pick to put your new fixture or whatever it is that you're adding all right and that's it for this video of course this is not everything you need to know for wiring but it at least covers some important things and some of the basics so contact a professional if if you are don't feel comfortable tackling wiring but i'll also leave you a link to a few other wiring videos that i've done in my house in case that's helpful to you i'll see you on my next project guys if you're interested in building outdoor furniture don't forget that i have a set of plans and templates for this glider not only can you make one for yourself but it makes a wonderful gift for just about any occasion you can click here for plans and here to subscribe to the channel [Music] you"

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"VideoID": "457",

"Title": "Electronics Level 3 - BASIC ELECTRICAL INSTALLATION Part 1",

"URL": "https://www.youtube.com/watch?v=olPzfsGVOIo",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] hmm hello class my name is thompson i'm a trainer at truvavo technical coordinative and today we are going to land together the model which is called basic reactor eco circuit installation in today's topic we are going to see how to install one gang one way switch at the end of this session each channel will be able to select and arrange different tools materials and equipment required while doing installation of electrical circuit he she will be able to install one gang one way switch as we are learning together i invite you to take some note and do a practical exercise with me as we're running together firstly you may ask yourself what is electricity electricity is the flow of electrical power or charge it is a secondary image sources which mean that we get it from the conversion of other sources energy like coil natural gas oil nuclear power and other natural sources which are called primary sources in summary is the flow of electrons through conductor such as copper wire there are two kind of current electricity which is direct current and alternative current a direct current or dc is the flow of electrical charge in one direction for example the battery cells and so on alternative current or sc is the flow of electrical charge that periodically reverse directions for example ac generators are rotary netters national grid and so on when you are going to do an electrical circuit installation firstly we have to select tools materials and equipment required to accomplish the task to do an electrical circuit installation those tools as you can see as a professional technician what you have to do firstly you have to select ppe which are personal protective equipment made to protect you against any hazard while you are doing electrical circuit installation such as groves helmet overall safety shoes and so on after that you select tools materials and equipment required for installation such as pliers screwdrivers hammer multimeter cramp meter wire or cable pipe switch socket outlet junction box circuit breaker fuse ramp lamp holder and finally distribution box as we finish to select tools materials and equipment required for electrical circuit installation now we are going to do one gang one way switch as you can see we bring our junction box which will help us while we are connecting or why we are doing this installation of electrical circuit as i told you remember that is one game one-way switch and i bring the fuse as you can see i fix it at i fix it and then by the use of a grilling machine i'm fixing this junction box and after that we have to bring the pipe and we have to measure the rent of each pipe in which we help us to conduct or to conduct our wires which are useful while we are doing this kind of installation you do it slowly and carefully in order you don't break or damage any other component as you can see that one is help us to join together two pipe in order to reach the location which is required and then after that you bring wires or cables which are useful to conduct electrical current as you can see the red one is for the neutral you connect it directly that blue wire is stand for fast conductor which is connected to one wave switch terminal to a suitable through the fuse of 6 to 10 amps the neutral is connected directly to the ramp when the switch is crossed the conductor is switched [Music] on as you can see you keep wire finish to to put on the wire tool to the pipes as i told you the red one stand for neutral and the brown stand for fuzz which is the feather of this circuit as we are learning together i hope you are doing a practical exercise with me as you can see i put on the cable from from the switch to the ramp directory and that red cable is the nostril as i told you and after that i'm measuring the cable which is going through the outrigger socket as i told you we're installing one gain one-way switch and we add one outlet socket as always is two cable the blue one which stands for first and then the red one which stands for neutral it goes through the outer socket while you are fixing them you do it slowly and carefully as always keep doing practical exercise with me as we're running together as you can see do it slowly and carefree while you are measuring the length of each cable either the first one or the neutral and wherever connect them to the pipes in order to conduct electrical current professionally so as a professional technician i remind you to do it accordingly and this switch is mainly used when you want to light on one light by those of one swing [Music] as you can see by days of scripting cutter we are going to strip or cut wire this cable to be connected to the circuit breaker and after that by the use of the hammer i fix all pipes by the use of hammer and pipe styles in order to be fixed well you can still do it slowly and carefully and after that you fix the red cable which is the neutral and you bring the cutting prior in order to connect our cable the neutral to the neutral i mean the red one to the red one and the face or the blue one to the blue one you can set your own screen as always you do it slowly and carefully as you can see we are connecting together bro cables which stand for their face which is the feed of this world circuit and by the help of universal prayer and after that as you can see in our junction box our blue cable are already connected and after that we are going to connect the red one which stand for the neutral the one came from the the fuse and the one came from the outlet socket and the one from the switch as you can see i'm connecting the neutral cable by the use of universal pliers and after that by those of israelite tape i israted each junction in order to avoid short circuits in our circuit and after that as you can see by the use of cramping meter or digital multimeter we are going to measuring the continuity of each area for example the neutral cable to the ramp the neutral cable from the fuse to the junction box connection you have to measuring the continuity testing in order to make sure that the connection of the junction you made are well done and after that you bring the switch it's time to connect it to the circuit as you can see the main part of our switch [Music] [Music] as you can see we are connecting the neutral and the face to the switch of the circuit as you can see it's already connected and after that we mount it to this box because when we finished to connect this switch or this gang we went to the outright terminal now as you can see those are the ways which has to be used when we connect the outlet socket as you can see we are connecting our outlet socket and we mount it again when we finish we bring the lamp holder and you connect the cable into the ramp holder in order to be fixed where as we finish to connect the ramp holder what we do we are going to close our distribution box [Music] and then we also close our junction box as we are learning together i hope you keep doing practical exercise with me and after that we go to the power supply and you connect it we open our circuit breaker when you open the switch the lamp is off and when you close the switch the lamp is illuminated or is on thank you for your attention this is the end of our session of today in our next session we will see how to install two-way switching circuit as we're running together i hope you took some note and you keep doing a practical exercise see you next time enjoy [Music]"

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"VideoID": "458",

"Title": "DIY Bathroom Wiring | How To Run Electrical",

"URL": "https://www.youtube.com/watch?v=NfRuLlTp5s8",

"Keyword": "Electrical wiring installation",

"Transcript": "today we are talking about running electrical I know something we haven't touched yet but I'm working on my own house here so I've pulled my own electrical permit and I'm going to take all the years of experience and knowledge that I've gained from electricians I'm gonna put it to work on my own bathroom and I'm I update my wiring from just a plug in a switch to all the modern amenities [Music] so before we get started let's talk about the legal implications of wiring in your own home if you do wiring and it doesn't get inspected and it's not on a permit in a lot of cases if you run into any kind of issue your insurance company is gonna run for the hills on you so disclaimer if you own your own home most jurisdictions let you do your own electrical work in your house depending where you live you might have to call in for a permit so double check in your jurisdiction before you go ahead and do anything like this because this stuff this stuff is dangerous and if you don't do it right you could run into a serious problem now in this particular case I'm working in my own home I did call the ESA which in our area is call the Electrical Safety Authority you put out a few bucks and you get a permit in a lot of cases it's based on how many electrical fixtures you're doing so it's a real simple application process it's less than a hundred dollars in most cases and it's definitely worth your time and energy to do it if you're comfortable doing this sort of thing now almost everything in your bathroom is going to run on a 14 gauge wire so that's a 14-2 or a 14-3 don't know too many situations we're gonna need a 14-3 so if you go buy one spool of fourteen two you're gonna have enough to get all the way there electrical panel why are your whole bathroom and you'll be good to go so this is gonna be our power feed for our first circuit in this bathroom we're gonna run two circuits and that's because I want to have a GFI plug and I'm also putting in a heated floor system so in my heated floor system I need to have that on a GFI breaker and I also need to have my GFI on a GFI breaker so when I put them together on the same circuit I have enough power to take care of the hair dryer and the curling iron and that sort of thing and run the power for the heat now the heated floor because it's a small space is only gonna run about two amps so I'm not gonna run into a problem where I don't have enough power but the both you have to be on the same type of breaker so by doing that it solves my problem the second issue that I have is power for all of my lights and everything else and that's just gonna be a regular 14 - I'll also run the bathroom fan on that and there's more than enough room on a breaker for running all of my LED pot lights because they take in early any power my heated towel rack and my fan I have a little extra to go so I'm more than safe here heading to circuits in another video we'll talk about working at the panel but what I'm gonna do is I'm just gonna run my feeds get my rough-in passed and then I'm gonna actually hire an electrician to come in and wire to the panel my panel is a little outdated and it's a little outside of my toolbox now knowing how to do your proper electrical roughing will save you a ton of money and I'm gonna just show you in our area we'd have to use staples to hold our wire in place okay and these staples on the package will tell you what wires that they're rated for so this is good for a fourteen two and a fourteen three wire which is what we have which is lovely and generally speaking our Building Code requires us to have a staple every five feet so what I do is I put one at the bottom one in the middle or at the top that's overkill but what the point of the staple is the staple is designed to keep this wire in place during the drywall installation which is why if electrician runs a wire after the fact he can just drill holes and fish it around because what they want to make sure is that this doesn't happen you never get your a wire in front of your stud before the drywall and if you don't use staples you'll see how flimsy this stuff can be we've seen it all the time we pull a wire wall off and we've got a compressed wire compressed wires are dangerous because they heat up and they can cause a fire which is why when you're putting in your staple you don't bury these little tabs into the wood and that leaves tons of room for the wire to move around so it's not under any kind of compression and yet it holds it in place so you don't run a problem with your drywall now in this particular bathroom I'm gonna be putting a strapping on the ceiling so I'm gonna put 1 by 3's every 16 inches or so so I have a channel that I can actually run all my electrical right up against my floor joist so all I have to do is make sure that I'm coming into my ceiling cavity inside the wall area and then wrap underneath and come across again making sure I've got a staple every five feet yeah so that gives me the ability to not have to drill so many holes which is awesome because I am short and I can't reach that with an ax ladder and that's a lot of drilling on a ladder now in order to bring this wire down we do have to go through the plate so what I'm gonna do is drove my auger Ben here okay love it here's my box and this is a two gang box means like I have two different functions on it we're gonna have one for our lights and we're gonna have one for the fan the other power for the thermostat is gonna be in a separate box we'll put that on in just a minute these boxes come in two different kinds this is called a welded box which means the sides don't disengage there's a different kind out there it's called the ganga box and the sides actually have little screw locks and you can disengage them and you can build on and add them longer and longer and screw them back together those are really common in a lot of commercial applications simply because people are always changing their mind about their electrical needs they've dropped ceilings it's really easy to make adjustments but in a residential environment if you buy the welded box I'll save you some time and energy because when you put that on your stud and you screw it in you're good to go if this is a gang a box with screws you then have to go and grab some 2x4 and screw that on to the other side of the box according to code and that has to be attached to the drywall and that makes sure that this side plate never comes disengage from that box it's a lot of extra work and you're only saving 20 cents so I say get the welded box make your life easy one more quick mention before we get going any further because you're in a bathroom we have to watch the golden rule that is 36 your electrical switches have to be 36 inches from any contact with water all right that's very brutal so my switch is gonna be here and I'm gonna measure over to our 32 inches on my shower wall is I got to make sure that I'm not thirty I'm more than 36 inches away from the edge of that glass if it said anything closer you'll fail your installation so you might want to think about where your switch location in your bathroom is going to go in a lot of cases that's one of the things that causes these inspections to fail so you might sometimes see it on the outside wall and then the Douro Swingle change so there's a lot of little nuances here make sure you just think through your plan so that your switch location is going to be more than 36 inches away from contact with water so just in case you're wondering my switch is gonna be exactly 37 inches from the edge of my glass which is more than enough now before I mount the box onto the frame remember one thing we're gonna be adding their wall surface and then a casing on our door keep in mind your options for your casing because there are a lot of different options out there traditionally like a new house bill the basic Builder trim it's gonna have a two and a quarter or two and a half inch door casing but they can come all the way up to three and a half three and three quarters and more so you got to figure out your design before you rough in your bathroom and if you're not sure you got to add a little building okay and this is a really simple way to do it whenever I'm working on framing a house I always leave my scrap lumber around so my electrician shows up he can do this and I don't want him to be coming to the jobsite and not having to buy floors because if he doesn't have him he'll mount the boxes without coming and then that's my problem later so there we go now I've got lots of room for my casing before my box I'm not gonna run into any situation even with the three and a half that I'm using don't forget the box isn't the side of the finish you also get a cover that goes over that okay and you don't want to have to be cutting the cover plates down in order to make them fit or have them just up against the wood it's always a nice finish to have a little bit of wall showing so give yourself a little extra murmur so on the mounting my boxes here's my rule I like to have one space for my wire to come in all right and these just break off nice and easy and then I take my power in and then my power out I like to come from the bottom and the reason I do that is just so that I don't get confused down the road it makes my life easy here we go now I'm going to set this bad boy at a comfortable height 54 inch you're shot in the box and you'll see that there are tabs on the front of the box and that is designed to set the depth up against the frame and the tabs at the back are designed to hammer into the frame now you can just push that into the softwood lumber like that nice and easy now after you get that done make sure you get some number eight screws like interesting a quarter inch and a half and mount this thing so it'll never move okay now your box is secure whoo-hoo okay now we're gonna just rough - mate that's about where enters the box then we're gonna cut our wire off cuz this is our power feet in alright now here's the secret I always give yourself extra this much wire is pennies so give it to yourself why make your life difficult all right now I'm short for this and I'm gonna just find that hole alright so in the code talks about every five feet you need a staple anytime you drill a hole through lumber and run the wire through it that's considered a fastening system or stable and so you don't need to have it here too here you can run the box straight in but the code also says you need a staple within 12 inches of the box so what we do is I like to always run myself down here like this twelve inches from the box is a foot so I'm going to be fine right here okay done now I'm gonna leave a little bit of extra okay I always want a little extra loop on my feeds in every direction and the reason you want that is say ten years down the road somebody that makes a change they open the box and the tip on the wire has been curled around the screw and when they're done taking it off and they go to reattach again it breaks off well then they got to put more wire into the box cut the sheathing back and then start over again if you run it all straight like that you're gonna run into problems possibly for yourself but you'll drive other people nuts and so try not to do that it's not necessary here we go now I got extra I'm gonna just get rid of that now now when your wire comes into your box right here you actually want to see the protective coating on both of these wires inside the box about a quarter of an inch okay so from that point down I'm gonna remove the trim now I can use my knife and just cut down the middle peel this open okay and that's it and that's good to go all right there we go now you can see the sheathing is on there okay next step would be to close that see there's a little little bracket here that tightens onto this under the wire and nice and easy right you don't want to be too tight on that either because you don't want to create compression on that wire there then you want to take your ground put it around your screw tie that on and then you take all of your feed wire okay and just curl it up now remember nothing in this box is gonna be live until you connect it at the panel so what we do is we actually are going to power up the box and get all the switches and on before we connect to the panel so you never have to worry about moretz and never have to wear anything being live because none of these are connected to the panel yet okay now this is my power in and my first which is always my lights my second switch is always my fan that's how I like to do it if you're not sure and maybe you don't remember you can always put a little code on the box with a magic marker light and fan now when you come back later you'll remember what's what nice and simple so now I've got power to my box and this one feet is gonna take care of the lights and the fan alright so now I want to run a wire from here up to my first pot light and then I can connect all of those wires for all the rest of those pot lights and I also have two one one from the fan over to where my fans going to go and just leave a loop in the ceiling okay so remember like I said like to have my wire coming in from the bottom so I'm going to again cut my sheathing feed that up into my box make sure that my sheathing is showing tighten up that screw good take my ground there we go now that's ready now in the same regard this wire has to be attached within 12 inches of leaving the box same code applies all the way to the fan every five feet and twelve inches from the box you need to have a stable okay now you can just kind of guesstimate from here I'm going six feet three six a couple for the feed and a little bit of extra so make my life easy and now we're able to run this up I drill a nice one-inch hole so I can run two wires for every one of those holes don't Jam so many wires in a hole that they can't hardly pull them through or your inspector is gonna fail you okay so I'm throwing a staple up here leave a little loop extra in the ceiling and then I'm bending down and I'm just going to throw a couple of staples on over to the van area so what I'm doing is I'm my fan placement is gonna be relatively over the toilet area I like it there because it's effective and I don't want it in the shower I don't want it over my vanity so it's a nice place in the room I have one ceiling so I can be a few feet away from the shower it's gonna have enough CFM's to really pull enough air now I'm gonna run this staple over to this wall and I'm gonna mount this again because I got my five foot roll all right now watch I don't want to have it too tight or too low that's why I raise it up here so when I strap my ceiling every board is just gonna be pushing that wire out of the way if I put it up that's easy now I got this coil now because I'm going to be installing a fan that's in after the market fan so when I'm done I'm actually gonna cut the hole okay I want to just leave this up in the ceiling so in order to keep this from having a problem just show you my little trick I'm just gonna throw a screw in the wall and the joist here to hang that now when the inspector comes and sees this and it's all strapped and this wire is held out of the way that's not gonna be a problem at all and I don't run the risk of having this wire getting pinched when I'm ahem stalling my drywall and then when I'm done I can cut my hole reach up grab my wire and look at that I've got four or five feet I can pull the wire through the hole comfortably wire that fan on my ladder and then place it all up into the ceiling after okay so now we've got our power to the box we've got our feed for the fan done now it's time to wire the lights but before we do that we want to map it all right very important to know exactly where you want your lights so what I want to just do is visualize my space here this is my shower wall this is my recess nook area so I'm gonna have my shower head coming off of here I have a 32 inch piece of glass behind me which means I would like to have 16 would be Center but I can go to 18 I can cheat a little off center we'll call that Center all right so what I'm gonna have is I'm gonna have a shower bar here and I'm gonna have a handle and a shower head it's gonna be spraying water everywhere and what I want to do is I'm gonna have a light pretty much right above that so I'm gonna measure off 18 right here and I'll put my mark and then I'm gonna go 18 inches from the other side of the other wall just so that the light is balanced not just on the shower but also balance with the bench so I'm gonna have two lights in here which would be more than enough one thing to remember with pot lights is over the course of eight feet it ends up shining about a five foot diameter of a circle so if you only have one light in your shower you're gonna have a lot of dark spot just to keep the thought especially if you're gonna add a bench end up with a five and a half feet I would put in a second light just so that you don't have that problem so now we're going to run our pot lights but I need a second hole because I don't want to run more than two wires in a hall I've already made sure nothing's above it which is important to do [Music] let the bit do all the work there we go put a bit of a curve into this bad boy and then it's a lot easier to grab when it gets up there yeah even for a short people okay now same sort of thing here if we're just going to come across roughly the same area right our center line on the shower is right here and so I'm going to come along and I'm going to staple it up here and then leave another curl another loop here for the connection you don't necessarily need to staple the wire here you're less than five feet from the fixture but again I want to have it up off the side of my choice just for convenience sake take your wire trimmers I like to have 3/4 of an inch to an inch pinched quarter turn slide off and what you do is you pinch it on the hole that corresponds with the wire it's almost kind of way too easy right so you hit the 14 because it's 14 wire and you don't damage the copper now that one's done I'll come back to my my place here so I need a staple every five feet and one within 12 inches of the box I can accomplish both of those by throwing this table right here okay okay here we go up through our hole for the lights now every light in this room is gonna be on the same switch okay okay now remember if you're renovating yourself you might not be coming back to do this process for a couple of weeks so you're gonna open up your wall and you're gonna be like wow what is what this is we're wiring like this works because you know the wire that comes through the top of the box that's my power right the one on the left that's my lights on the right is my fan all my markings are there this may not be the system you use but make sure you have a system okay so you have two options when you're running a bunch of pot lights in a bathroom when did you run a single feed right and then you want to make a map of where you want to drill all your holes and then you can come back later drill all your holes fish wire because we're adding strapping you have that luxury or you can run all your wire in advance I kind of like to run on my wire in advance it's just a good habit to have and find it easier to measure off and make my map so there we go I'm we're gonna run a wire along have it sticking down roughly where my black marks are and I'm gonna cut it and then install it this is so much easier to do before you put it up and the reason why is because after the fact you're gonna be doing all this wiring probably working above your head and that is a long time to be wiring all these pot lights above your head so if you do it this way you try not to fall off your ladder if you do it this way it'll just make it easier for you down the road okay now what we do is with these we're actually going to just tie them together a couple of twists alright put them up in the ceiling here so that they don't fall out now trust me when you've drilled your hole it's real easy to pull this out and then identify these wires and then pull them all down but this way you know that nothing here is gonna get caught in your straps or your drywall all right so my bathroom is actually five and a half by almost twelve is extremely long so what I'm putting in my lights I've really got to take one effect this this cone lighting that we're talking about comes from the light and it comes down to five feet diameter at the bottom and when you're walking in a room like that with pot lights traditionally and that's all this white brightening up the room you don't want to walk from a light zone to a dark zone back to a light zone again because it's very spooky weird you know your eyes are constantly adjusting as you walk through the room because you're good entering into different stages of lighting so what you want to do is you want to try to get enough lighting in this room that is somewhat consistent at eye level so you're a little bit more than halfway up which means I'm going to be about a two foot wide beam of light coming off that light at my eyes so every couple of feet I really want to have another another beam of light picking up the last one okay so if that's the case I want my lights no more than four feet apart so that when it gets down to eye level my beams are intersecting all right so then I have a nice continuous light where I'm walking my eyes aren't freaking out going in and out of the dark and light area now you'll see this a lot in basements they don't put enough lights in they've only got seven foot ceiling it is really weird to walk around because it's like little pieces of light coming through the ceiling it's kind of strange that automatically gets me down to almost an eight foot room sort of no-brainer on the map four feet here runs me right about here send her over the door a couple inches off I'm gonna live with that because I want that to be aesthetically pleasing when I walk in it's also the area where the toy it's gonna be so it's nice to have some light here and then we'll go another four feet over BAM perfect that is actually one foot from the wall which is a perfect location for the lights over the vanity there's a little bit of light right in front of your face and then we're gonna add a vanity strip light as well because ladies we all know that pot lights are no good for makeup you've got to have a light on the wall shining directly into your face or you're gonna have a really bad time trying to get your makeup done if all the lights coming down your face like this you have nothing but shadows and that is horrific so here we go we want to cut the wire before we go up on the ladder so we don't work four feet apart right grab your wire stretch out your hands yeah four feet a little bit for that tail a little bit for the other end and then we'll get it of course while we're here we can work below our heart which is nice and easy on the body cut that wire expose the ends I'm not worried about it the reality is this when I'm doing my strapping it's not so much science 16 inches apart is good standard but if that's right where my wires gonna go I'll just make it 14 because I can see everything I'm doing as I'm installing the ceiling so now it's just a whole lot of rinse and repeat right like just make sure you leave yourself lots of extra wire in the ceiling so you have a little bit of give-and-take in case you end up wanting to change some of your flooring your wiring design after the fact which wouldn't be all that uncommon here's my second power feed and this one is designed for my GFI and my floor heat system so what we're gonna do is a lot of the same stuff I mean it's still 14 to wire roughing it is almost exactly the same the only thing you have to do is you have to consider the counter depth for your plate right and this is more design than anything because check this out I'm gonna have a counter here I like to finish my vanities at 36 but in this particular design we're putting in a different size vanity I'm gonna surprise you with what it is or the vessel sink now the vessel sinks usually have about a six inch rise on them so I want to actually have my counter tone thirty which is going to be a little bit freaky visually to look at but that's my counter okay let's add a little bit for flooring when I'm sitting here with that as a counter space one thing you don't want to do is you don't want to have your plug way too up here all right cuz then all you got to do is you have wires hanging the entire time it looks like junk so try to keep everything on your bathroom wall if this is my counter here and here's my vessel sink and here's my top okay your your line of sight now with a mirror you don't want anything above that mirror line anywhere around okay that keeps it nice and clean and tidy so that's about as high as I want to go for my plug I can go from here down to here I'm gonna split the difference on this one and put it in the middle that gives me flexibility in case another design change yet again try to consider that as an option and here we go basic and you know the plier hammer alright it's just awesome okay now that's my feed of course I'm gonna have to put in a staple right here put some screws on make sure these things aren't going to move around on you okay next we're gonna drill a connection through our stud wall because I'm going to take power from the GFI to run my floor hitting system and I'm gonna locate that box over here just because I don't want to have too much going on in that wall in the one spot and I'm gonna drill this hole whoo what I'm running into there that's crazy yeah time to get the file and share from that bit no doubt so I just grabbed my extra long box here and I realize it's not welded it's gang Apple box and that's the other variety I was talking about in the beginning in the video so here I'll demonstrate you can actually loosen up the screw oh there we go and you can take that off you can actually screw on the next box in the next box and then when you're done you put all these connections back together and you can put the screw back on and that makes your box and because this can come apart like I said they require us to add another piece of blocking so we will do that now I'm gonna put the thermostat a nice comfortable height this is programmable and you're gonna want to be able to see the buttons and read your instructions without bending over and being real awkward so we'll do that I've got room on the inside yeah pull the top of your power in pull the tab down here as well for the heating cable and pull the other one for the thermostat wire okay you're gonna have two leads coming out of the box and one coming in dude no it's kind enough to go from that box through our nifty hole down to this box and I have to connect it and I know I've got a lot more wire there than I need like I said it's so much easier to work with the box like that now since there's only power for one other thing coming out of this box doesn't really matter GFI's the way that they were run is you'll actually wire both of these all right into the back of the box and it doesn't matter which wire goes in which location before we get too ahead of ourselves we'll connect all of our ground wires very important whenever you're putting a wire around a screw you wrap it in the direction that the screw is going to turn when it's closing and that'll pull the wire tight into it now the last part of the thermostat wire roughen is the lead wire this is very important this is going to be set up so that you can tape your electrical wire from your floor to the end of this wire and then you can pull it up through the wall to the thermostat later now basically what we're gonna do here is we aren't gonna use the whole wire it's just a little bit too much it's too thick it's not very flexible rather inconvenient so we're gonna splice that off all right and we're gonna use just the copper wire okay there we go now what I do is I'm gonna attach that copper wire to the ground screw so there we go now that wire isn't gonna get pulled out of the wall I'm good to go now all I have left to do down here is set up for the base so when you're running a heating floor you're gonna have a wire coming down and it's going to come out at the at the base plate right at the level of the heating floor in this particular situation our floor mat that we're running our cable through is actually gonna be attached the floor and it's only a quarter inch thick so what I need to do is I need two flat bottom hole my plate so I have room for the wires to come in and out at the plate convene lead with a tube sharp of an angle she's a beast all right so again take care of that one he doesn't throw it across the room keep your blade sharp you'll be fine and then what we do down here is we set the wire like that and then we'll grab one of our electrical staples to hold it in place during construction all right nice and gentle and just keep that right there like that so now when we're doing our drywall work this is out of the way we've got something we can actually attach and pull our wires for later that's all done my power feed us here all I have enough to do now is is add a couple more staples and that's all done now this wire here is used as a fishing wire okay the idea is when you run your cable on your floor for heated flooring system you start at the end and work your way back to the beginning and then you connect your ends and then you pull it all up to the box now you generally don't put your heating flooring on until it's all said and done so this is why you want to have this wire in place it is really difficult to feed a wire down to the floor especially if you haven't drilled out the plate after the fact without making a huge mess and wasting a lot of time so this makes your life really simple all right update so we've got two different power feeds now we've got our GFI which I'll have a GFI breaker at the panel we have another regular 15 amp they just gonna take care of all of our lights and our fan and there's one other aspect that I'm gonna have it take care of which is really kind of cool I'm putting a heated towel warmer right here on the wall it's not a massive unit and my unit only runs on half an amp so put that in perspective that would be the same as about a quarter of one incandescent 60 watt light bulb which is awesome so it's hardly using any power this low voltage it does not have an on/off switch just stays warm all the time so that's a great benefit you don't have an extra switch you don't have to come in and push the button and hope it warms your towel up while you're having a shower just stays warm it's not going to heat up the room or anything like that so it doesn't really affect the atmosphere but it will make your towels very comfy so you can leave them on there all the time and I'm loving it a couple of requirements for heated towel rack one of them is electrical the other one is mounting and here's the trick these heated towel racks because it's electrical fixture you've got to have a box that the wire can be wired into and it all slides in with a decorative cover and then the heated towel rack mounts over top of it but the other mounts have to be onto a stud on the left hand side so if this is my power my stud has to be where the mounts are so you have to take your product have it on site okay this is another important when renovating a bathroom have your finished products on site when you're doing your rough-in you'll save yourself a ton of aggravation so this particular box the the mounting points are 23 inches from the left and the right side okay so if I want to put the mounting in the middle of my stud that means my other mounting position is over here okay that's my center line for mounting makes sense if I come back here I'm right off the edge of my tub it's gonna look stupid so I have an option I can add another stud but I also have to be 36 inches from this connection to my shower so I have to be careful cuz my shower and it's because I'm building a bench this is all open there's no door the inspector is gonna say from this point over I have to be 36 so here we come to the design I can't be any closer than this point right here so if that's the case then I'm gonna just mount it on this stud centerline to centerline now I know I'm good to go I'm not gonna upset the code and I'm gonna have it in a very convenient spot as I walk out of my shower it's right there in front of me after that I've got lots of room to install the toilet and still a ton of space left for the vanity really happy with the way this is gonna layout so let's talk about what we got to do to mount it because can't throw the box in the middle of a piece of plastic in it so we're gonna have to do some work here a we want to figure out how high we want our our towel warmer and it's a 24 inch unit okay so maybe something like this so when you're pulling your towel off it's a nice big chrome bars nice and convenient you want to bend down for it you know one above your head so I'm liking this we'll go with the insulation line that's an easy way to remember so here we are and the reason I like that is because I have to cut my plastic and open this up now to mount my box so let's do this right down the middle come across here and just fold it out of the way now I have to get a piece of 2x4 and I want to there's the old insulation in the back I want to get a piece of 2x4 in the back so I can mount my box get mounted right across the back and then I'll be able to be perfect [Music] now in this scenario you want to cut your insulation out of the way don't just push it whenever you fold or push insulation out of the way you always create an air space around your fixture okay and that's where they're gonna get a draft so whenever you're putting a metal box on the next gear your wall and even though this is like a second wall built inside it was it's still my point of vapour barrier right you want to wrap it in plastic like this before you mount it okay hey okay let's get a couple of screws in this bad boy no that box isn't gonna go anywhere we were gonna want to run your wire to that good so now we're gonna pull my insulation forward again okay should I put this back up I'm gonna force my installation by stretching it around that box my plastic here sir I'm stretching it around the box then I'm gonna pull out what was there and then I can tape all that together and make sure that I got a continuous vapor barrier all right that's actually a video right there in it so here's the joke right sometimes when you're doing wiring it involves a lot more than just wiring there are so many interconnected parts of the building code first we want to seal up where we penetrated the vapor barrier in the first place okay all right and I always keep your finger on the backside so you have the same strip for the next time all right now there's no such thing as using too much tape there is such a thing is not having a vapor seal and the idea behind this is to make sure that the air isn't passing from one wall cavity into the room so if you're lazy here you're gonna end up with air blowing around and that is how that is done and then you're gonna realize I forgot to run the wire lovely yep so I just cut the plastic here I'm gonna run this so I can put the put my wire in behind the stud here on my my top plate and then into the ceiling cavity and then and I'm gonna be running it out of the way after that okay as long as I'm running my wire inside the vapor barrier it's perfectly acceptable but remember you still have to get all your staples in so you might have to do some creative stretching and maybe cut the plastic and tape it all up and then put a staple in do what you got to do okay so after you're done running wire in this kind of an environment and this only happens if you've got insulation vapor barrier on beer and then you change your design love design changes like I said to get it done ahead of time make sure you're all sealed up everywhere where that wire comes in and out of the vapor barrier and then we're just going to run that back to the box the trick here is I am doing one thing a little bit differently here I'm not going to cut the sheathing on this one this time instead I'm going to label it because it's constant power and when your wire in your box you want this connected to the feed black and white okay so we're gonna put on here towel and always easier to write in block letters can't use cursive on this wire all right and then we're just gonna run that over it stick in the box and so then when it's time to do the finishing I know that that goes the tile warmer and on low that it gets directed power over there beautiful I'm just gonna run that in the ceiling a couple of staples and worldly so here we go that's pretty much it for running roughing in and electrical for your bathroom I mean honestly if you have anything that you need to run that we didn't show you today that's gonna be quite a spectacular bathroom a lot of space that we've got lights we've got switches we got GFI we got heated flooring we got towel rack one other quick mention for your vanity light we didn't show it on the video here but we're not sure what kind of light we're going with quite yet so I'm not gonna close up until I got that sorted out there are two kinds of vanity lights on the market one of them were you in case steel box and you can run all your wired direct into that box and then mount it to the wall and the other kind of requires an octagon box on the actual stud wall as part of the framing so depending on which kind of light fixture we end up with you actually run the wire differently so we don't want to get overly committed until we get that sorted out this is the problem you know one step at a time every time you got to make a decision it has a consequence so just remember we're gonna tie it in with the rest of the pot lights on the same switch make sure you got your staples and all that kind of stuff and you'll be fine now if you like this kind of content then please feel free to hit the like button share it with your friends and if you haven't subscribed to our channel yet by all means hit the subscribe button on the bottom of the screen right there so make sure to check out all the videos on our modern rustic farmhouse remodel and don't forget to subscribe"

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"VideoID": "459",

"Title": "How To Install An Electrical Earthing (Easy Way)",

"URL": "https://www.youtube.com/watch?v=uNmFVhomJHw",

"Keyword": "Electrical wiring installation",

"Transcript": "today we are talking about a a very important part of any electrical installation why do I say so this is a path whereby excess and harmful electrical charges will find their way to the ground and once in the ground connect back to the source which is the Transformer before it gets back again to the Circuit as safe electricity now today we are learning a lot concerning this aspect and I will be taking you through the same smash the like button all right now for this case here I have this meter box my client had asked me to check thething system thething system had an issue now I would want to upgrade it already we have an athing system for this house as you can see uh using this pipe here there is an earth connection that is below here and there is an earth road that was actually immersed in that ground but my guess is as right as yours because you know what this ground probably has failed in terms of conductivity of electricity to the Earth remember a perfect athing must ensure that the charges that will flow all the way to this electric Earth road is actually dissipated to the ground meaning the conductivity of the ground that is in contact with it must be very very perfect to allow the charges to find their way to the ground now there is also a need for regular inspection so this part here does not have a place where you can do regular inspections as well as do several maintenance and checkups in case there is any problem now let us discuss something that is very important which is the ground where you have to install these Arad I want you to walk with me on various surfaces in this compound where we will be talking about the conductivity of electricity from the AR road to the ground as you see here this is a very hard place because of of the cement and everything so this definitely is not on our list of a good conductivity area so when we look at this ground here this ground is somehow wet and it is basically a good area where conductivity is high and uh we are considering having an AR Road either here or we can add it on that uh ground now let me know what is your idea must we stain on a specific location or is it good to have it where it will easily conduct the charges to the ground let me have your comments on the comment section so here we have this ground at this point we have a lot of sunshine meaning the ground is dry now if you compare these parts here where we have a lot of sunshine and that part there which has a lot of Shadow from our tree there's a difference because once there's water there or once rains uh fall on that area it in automatically increases the conductivity of that uh soil compared to this part here so come with me let me show you areas that we can study and are of importance to us concerning this Earth connection this is cement if we decide to have it at a place such as this one it means that we will have to dig a pit and add a lot of materials these materials are for instance salt sand and charcoal if we were doing this here again there's this ground here which is not entirely cement and if you can follow me also on this area here we have this ground which has a lot of rocks we are not sure whether the rocks are covering a bigger chunk deep inside this Earth section where we need to have our AR road now for us if we want to have it here then to mean that we will dig this part and create an earth pit where we will have a lot of materials to be added because if at all the conductivity of this place will not be good enough for the purpose ofthing we definitely Ely do that so for us because we have options we don't really need to strain ourselves here come with me let me show you another important area where we can have our AR road instead of struggling with an earth pit now we are here in this Farm here of my client and also my friend and when you look at this part here it is covered by these bananas this simply means that most of the times this area is covered by the banana Shadows that implies that even the ground once it rains or after a very long time the ground is still wet so let me take this part here and try to dig or probably expose or show you the nature of the soil that is here to confirm that most of the time it is wet and the wetness in the soil definitely improves conductivity also the type of the soil matters a lot you can see it is very soft I'm not even using a lot of effort to get it done soil here is very very soft and I can simply use my hands and excavate these part here will not be going too far and you will start seeing the soil is actually changing I can even feel some wetness or some cold I can feel some cold in my hands so this also shows that it is also another ideal location or place that we can have our Arad but since it is in the middle of the farm you definitely cannot have your Arro here because of the activities that may be happening here there is a time that there will be farming and the farm tools might actually puncture the athing connection or the Earth wire that is conducting these charges to the Arro or probably can be cut meaning that that home is not safe from electrical churches that is why we cannot have it at a place such as this one so that was just to demon demonstrate to you and show you that ideal places forthing are places where you don't need to improve the conductivity of Earth conduction of electricity in this place because we have a lot of options let me go and show you the best option that we can have our Earth Road where we can have it installed properly come with me [Applause] [Music] now at this point we have this meter box here and this was the initial place where there was a meter box where the power cable was dropping and the Earth connection was installed here by my predecessor electrician but since it is no longer serving its purpose we will have to upgrade now an ideal place for me to have that Arro definitely is here under these meter box then if we have it here this is a better place because most of the times this area is covered by the Shadow from this wonderful mango tree meaning that this soil here is also a better material whereby charges can easily be conducted from the AR Road dispatched or dissipated to the earth now even if I try to use a lot of force and energy this place is very much ideal if you can come closer you discover one thing that indeed this soid here has a lot of moisture and our goal is to ensure that we have a lot of moisture whereby Arad will be able to conduct properly with the charges so now what you are seeing here is wet ground this ground is very wet whereby you can have the conductivity made very simple now at this point here it tells me that this is perfect place for me to have my Arad and if I have it here I will not necessarily require to have salt the industrial salt or to have charcoal or to have sand and everything that people use because here it will simply do the work that it is in intended to now what will I do for that just a moment let me get the right tools and also show you how we will do that procedure very effortlessly so at this point that I have here I will add some water even with my hand you can see without even hitting it already is sinking in without using a lot of force now I can go ahead and use these to heat it so it is so simple for me to Simply have it go all the way in but the trick here is to continue adding water just like so notice how easier it is for me to use my hands without applying a lot of force when I'm getting the Arad in I don't really necessarily use the hammer at some point I'm just using the hand like so and so it is important for me to keep on doing that so that the surrounding of this is actually water loged also add some more water so where I experience some hardship I simply use my hammer to get past it again this is an important point for you to note that I don't necessarily need to improve the conductivity of electricity to this ground here especially here because my Earth here or my ground here or the soil tells me that it will be easier for it to conduct electricity charges to the [Music] ground still not using a lot of force meaning there are no hard rocks [Music] inside [Music] [Music] now having connected our AR road we are sure that everything is okay now what we want to do at this point is to ensure that we have this pit proper our Arad in the ground and ensure that everything is okay what I will do more is to ensure that I cover this area here so that this wire that is coming through this conduit from our meter box is inside of our Pit and the cover will also have a lead whereby to check here and to also take the readings but in the meantime I'll ensure that I connect my wire here import important to note also is to ensure that I do not screw on the insulation notice that I've backfolded my wires to ensure that it has a high surface area conductivity with this copper road so that it will ensure that all the excessive charges flow to these copper Road here now in regards to that Earth connection we will do more of videos in regards to how I will do that pit as well as the connection at the cutout if you have not subscribed to my channel subscribe so that you will not miss that episode now smash the like button if you have found value in this episode see you in the next video my name is John [Music] goodbye"

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"VideoID": "461",

"Title": "Electrical Control Panel Wiring in 9 Minutes with KNX",

"URL": "https://www.youtube.com/watch?v=q8iWwK-XxEw",

"Keyword": "Electrical wiring installation",

"Transcript": "if you as an electrician engineer or control \npanel Enthusiast I've been looking everywhere   to level up your electrical control panel \nwiring skills and want to see the process   from start to finish building a panel then \nget your tools ready because in nine minutes   actually it's nine minutes 11 seconds I hope \nthat's not a deal breaker I'm going to take   you on a journey turning this blank useless \nunhelpful metal canvas into this completed   fully functional good looking work of art if \nI do say so myself okay guys so I'm watching   this on my iPad and I'm going to be talking you \nthrough what I'm doing as the video progresses okay yeah so here you can just see \ngetting things unpacked and then   starting to Mark out the lining or the \nlines for the trunking and the DIN rail   and then I'm just measuring up the trunking \nhere just getting it to the right length getting the holes marked onto the back \nplate of the panel cutting them to length and then what I do here is I label whether it's \nD for DIN rail or t for trunking and it just sort   of makes it easier to when you've got them all cut \nto length to um line them up where they should be   and again you can see here I've just uh \nmarked the holes for the uh the drill   and I've just Center tap them now I'm going straight in with tech \nscrews some people might disagree   with me on that one but it's far quicker \njust to go straight in with tech screws   rather than doing like a \ndrilled hole and a tapped hole okay just double check in my layout just snap \nthe finger trunking really satisfying that is   now weirdly this is one of my favorite Parts \njust getting all the components onto the panel   uh to match the layout drawing that I created \nI don't know what it is just I really like that   before any of the wiring goes in it's just nice \nto see all the components there ready to be wired up to The Loft again to get components you see there I was just marking \nout the holes for the Earth bar drilling the holes there I forgot \nabout it when I was drilling the back   plate earlier for the DIN rail and \ntrunking forgot to do the Earth bar yeah also same thing for the contactors with \noverloads so I didn't put those onto a bit of   din rails you can see they're slightly offset or \nthey wouldn't have been aligned with the rest of   the components on that DIN rail so they're drilled \nand tapped or text screwed uh separately as well and here I'm just getting the distribution circuit   terminal blocks and just labeling \neverything ready to start wiring   I always start off with the the main supplies \nso you can see the thicker cores of the the um of the um sorry got distracted \nof the neutral and live there   and then next Pro next thing I do is I put in \nthe KNX cable so that green cable that sort   of buses along to all the components \nthen doing all the neutrals foreign I think one out of the other side of \none of the mcb's to start feeding I   think these were the relay feeds \nthe live feeds to the relays   as you can see there I'm coming off that \ndistribution block in the sort of middle left so yeah I focus on the the main side first \nand then move on to the extra low voltage   which is what we're doing now so those \nwhite cables therefore either digital   inputs coming from relays or contactors to \ntell our PLC or KNX Electronics in this case   that Something's Happened out in the field so \nif a relay energizes or contact energizers we   then know that through the electronics those \norange cables they're accepted circuits so   um say for example we isolated the panel we might \nstill have voltage coming in from a separate   Source outside of the panel that could potentially \nbe live so all those cables are in orange now the red cables there 24 volts DC and now \nwe're on to just marking out the front panel door   it's not too much going on this one um \nreally like this panel actually it was   a budget BMS panel so it didn't have \nall the cam switching indicator lights   but yeah it was for um HVAC \ncontrol within a plant room yeah I know you can see here using the \nlaser method to Mark the center of the   shaft for the isolator the door isolator foreign moment doing that giving it a deeper getting that mounting plate nicely \nSquare for um forfeiting the touch screen now those holes were properly drilled \nand tapped no Tech screws used there and there was actually quite a few modifications \nto this panel things changed on site so uh yeah   I I went back and had to modify things a few \ntimes on this before it actually went out to site guys if you found this video helpful \nreally appreciate a like it would   um help the YouTube algorithm then \nfeed this video to potentially other   people similar to you looking to \nlearn a bit about control panels foreign yeah and here you can see I'm just \nuh adding the cables to the doors so yeah that'll be power and \ncommunication going to the touch screen   and I can't remember what that light was \ndoing on the front actually it was either   I'm like a general fault light or \nit was a control circuit good light so that's the 24 volts of the touchscreen \nthere that red and black cable oh yeah guys if you want to learn a bit \nmore about electrical schematics there's   a link in my description that will \ntalk you through all of that thank you finishing off that Earth to the door   and within the panel as well bottom \nleft hand corner of the panel and getting the trunking lids cut get quite particular about this I want to \nmake sure they're like absolutely perfect   especially the horizontal ones want to make \nsure that they butt up nice and tight but   without warping things to the horror to the \nvertical ones now this panel was controlling   all the HVAC within a plant room for a high-end \nresidential property in London using KNX and if   you'd like to see something similar but for \na much smaller project using locks on then   why don't you check out this video here where I \nbreak down the steps into much smaller details"

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"VideoID": "463",

"Title": "Germans do the PERFECT Electrical Wiring! (Garage Build)",

"URL": "https://www.youtube.com/watch?v=wsJONukJlLI",

"Keyword": "Electrical wiring installation",

"Transcript": "As you can see it finally happened my \ntwo part concrete garage got delivered   which was certainly a spectacle for me.\nAnd in case you are completely confused   right now then let me tell you that I \nam currently in the process of getting   a house built and the garage is basically part \nof the package where I can later park my car in.  But as you can easily see this garage \ndoes offer more space than a car   requires with measurements of 6x3m and 3x3m.\nAnd since I am more or less forced to install   mains power anyway, because the garage door \nrequires it to function, I was thinking about   what other electrical features I should include.\nI mean stuff like outlets, switches or lights are   obviously mandatory, but I also wanted to include \na bit more advanced, but still super useful stuff   which you also might want to consider when it \ncomes to your next electrical installation.  So sit back and enjoy the show of how I spent 5 \ndays inside a super cold garage with my friend to   turn it into my ideal workshop.\nLet's get started!  This video is sponsored by Keysights Lab \nYouTube channel which is actually not a   boring corporate channel. Instead the videos \nare all created by Keysight engineers to   bring you test gear tips as well as tons of \nedutainment about all kinds of electronics.   For example they offer oscilloscope tutorials, \na lab tour with curious mark or an exploration   of 5G and as I have heard they are planning to \ndo a big test gear giveaway soon over there.   So make sure to subscribe today to not miss it.  Now before doing any electrical work \nI firstly needed some workbenches   in there which I wanted to position in two \ncorners just like shown here in my planning.  And since I have been using the workbenches in \nmy lab for 5 years now and I am very happy with   their design, I decided to replicate them.\nAnd getting the wood material for the   bench itself as well as the supporting wood \nlathes and the stands was really easy to do.  But what was hard to do was moving the \nbenches around all by myself because   they each weigh around 70kg, so please \ndon't ask how I did it in the hand.  Before getting to that part though, I \nfirstly had to cut wood laths to size   with my newly acquired mitter saw \nwhich made things so much easier.  Then I drilled a bunch of 4mm mounting holes \ninto them, painted them all with wood stain   and got my laser ready and in position \nto show a level line at a height of 84cm.  At this height I held up the wood lathes \nin order to mark the position of their   mounting holes onto the wall, so that I can \ndrill into it, hammer in tons of plastic   anchors and then use them with the help of \nscrews to hold the wood laths into position.  And as soon as this task was done, I moved on to \nthe actual workbenches by simply cutting them to   size, painting them with the same wood stain \nas before, securing the metal plates for the   stands in two corners, attaching the stands \nand then finally lifting the workbenches   into place before permanently securing them to \nthe wood laths with some more metal brackets.  All in all pretty straightforward stuff, \nbut it still took me around two and a   half days to pull it all off but I think \nin the end it was definitely worth it.  And with that out of the way it was time \nto move on to the electrical installation   and to do that I firstly started out \nwith a simple outline of my garage.  In there I positioned the symbols for lamps, \nswitches and outlets in a way that it would   make sense when it comes to everyday usage.\nFor example a double switch right when I   enter the garage so that I can individually \nturn on or off the front or back lamp pairs.  And speaking of lamps I chose the exact same \nones I used in a previous video in which we   upgraded the garage of my electrician buddy, so \ndefinitely check that out if you haven't yet.  All the other standard components are \nalso pretty much the same as before   because why change something \nif it works perfectly fine.  But when it comes to new stuff then we \nadded 3 previously not shown awesome   features and let me begin right here \nwith the way these outlets are mounted.  Normally you would screw them into the wall \nand probably never move them around again.  But I wanted flexibility and \nthus decided on these special   wall ducts or Brüstungskanal \nhow their known in Germany.  What is so special about them is that \nafter mounting them to the wall you   can get yourself special outlets that \nyou can secure inside them super fast.  And if you are not happy with their position or \nwant to add more you can always easily move them   around and best of all you only have to hook up \nthe first one to a proper mains voltage wire.  Afterwards you can use such premade connectors \nwires to daisy chain the rest together.  And the last big plus point of those \nducts is that there exist a few more   useful electrical connectors you can mount inside \nthem including an empty component box meaning you   can mount pretty much everything in there.\nOK, so wall ducts are pretty awesome and   I would highly recommend them, but what I \nthink is also awesome would be a CEE socket   here and two emergency stop switches \none here and one next to the entrance.  In case you don't CEE sockets look like \nthis are basically normal outlets on   steroids because they can supply three phase \nmains power with 400V which means I can hook   up some really high power stuff later on.\nAnd I think emergency stop switches like   this one are pretty self explanatory \nmeaning that if they get pushed,   I want them to immediately turn off the CEE \nSocket as well as the outlets on the workbench.  The reasons for that are of course safety \nones when working with bigger machines   and to accomplish that each stop switch comes \nwith an integrated opener and closer which in   combination with this big 4 phase relay \nshould be able to turn everything off.  So with that in mind I created this flow diagram \nfor the garage in which you can see the relay and   the two closer switches of the emergency stops.\nIf either one gets pushed, the relay activates   and opens its contacts but if you are \nprofessional right now you might say that   this is not the correct way to do things.\nBecause yes; even though this system does   work in normal use cases like seen here, it \ndoes not come with a cable break protection.  By that I mean that if one wire to \nor from the closers break then the   relay will never activate and thus the \nemergency stops are pretty much useless.  That is why you usually use a normally open \nrelay and an opener to make such a system   because there the relay is always turned on \nand if either a cable break happens or the   opener gets pushed, the relay turns off.\nThe only problem with that is that since   the relay will always be turned on during \nnormal operation it would draw 26W of power   continuously and that is something I didn't want \nand thus instead used the half way safe version.  With that being said, the three big new \nelectric features of my garage should be   clear and my flow chart with all the protection \ndevices like safety fuses, ground fault circuit   interrupters and circuit breakers was also done.\nAnd by the way choosing the right protection   components in combination with the required \nwires and their cross sections and ultimately   wiring everything up correctly is definitely \nthe reason why I would never recommend a non   professional to do such a job because if you \nmess something up you can not only hurt yourself   but there is also a possibility that things \nnot work or eventually even start a fire. And with that little disclaimer out of \nthe way, it was time to start the actual   electrical installation by doing that what \nprobably everyone can do and that is attaching   all the components to the walls or ceilings \nwhich includes the lamps, switches, outlets,   CEE Socket, the sub-distribution boxes, the \nwall ducts and finally the emergency stops.  The next step was then to create a pipe system for   the upcoming wires and to keep the \npipes in place we used such clips.  So we went ahead and secured tons of those in \nfront of not only the already existing components   but also in front of the junction boxes which \nwe added to the walls at around the same time.  After all of that was done we cut the pipes \nto their correct sizes and pushed them all   into place which was quite satisfying to do \nbecause things finally came a bit together.  Now at this point I threw all the different \nkinds of wires we got onto the table and we   started guiding the correct kinds to their fitting \nelectrical component and let me tell you for such   a task it is handy to have two persons at hand \nbecause wire can be a bit stubborn at times.  The mains differences between the wires by the way \nis their cross section which basically allows more   current to flow without heating things up and \nthe number of single conducts they consist of.  For example a normal outlet is happy with \n3 conductors but for an additional double   switch you will need 5 because you are \nnot allowed to switch either the N or   PE wire thanks to German electrician rules.\nBut anyway after all the wires were in place   which also included the wires going in and \nout of the wall ducts, it was finally time   to remove part of their insulation and hook \nthem all up to their electric components.  And this wiring of course also included \ndoing all the connections inside the   junction boxes with the help of Wago terminals.\nAnd as soon as all of that was done which included   finishing up the wall ducts, it was time for the \nlast big task and that was installing and wiring   up the sub-distribution box for which we invested \na bit more time to make it all nice and tidy.  So after 3 hours this wiring was also done \nand sadly the only way to test everything   at this point was using the 1 phase \npower I got from the construction site.  But as you can see everything seems to work \nperfectly fine just the way I hoped it would   and I am quite pleased with the end result.\nSo now I am excited to hear what you think   about this installation and what you might have \ndone differently. Let me know in the comments.  Of course I hope you learned a bit \nabout electrical installation through   this video and if so consider supporting \nme through Patreon to keep the show going.  As always don't forget to like, share, \nsubscribe and hit the notification bell.  Stay creative and I will see you next time."

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"VideoID": "464",

"Title": "Industrial electrical panel wiring training with all details",

"URL": "https://www.youtube.com/watch?v=0eF0iZ2YWj4",

"Keyword": "Electrical wiring installation",

"Transcript": "Hello friends welcome to my video in this video I'm going to teach you have the assemble an industrial electrical panel this electrical panel includes eight singlephase electric motors and two three-phase electric motors the first part of the electrical panel assembly is the installation of rails and Ducks which is done in this way stay with me [Music] this distance is 13 cm and this distance is 18 [Laughter] [Music] cm now it's time to install the equipment this electrical panel has three rccb switch Each of which is connected to the two miniator switch a face controller is installed next to these three keys which send a warning message if one of them is disabled we install five miniator switch here we also install a three-phase rccb switch which is connected to two contactors and for that we installed a phase controller to prevent two phases of electric motors now we install two miniator suits for each of the rccb sues now we install two contactors for three-phase electric motors we also install a current controller for each electric motor motor to protect the electric motor from access current now we installed the main terminals of the electrical panel CT electricity ENT the electrical panel from the red terminals this electricity consist of three phase wires and one n wire when we install the necessary electrical terminals in emergency situations electricity enters the electrical panel from these four terminals now we install the output terminals from singlephase Electric Motors both output terminals have a common null and this common n is the related RCB is connected now we install two single phase outputs for the top R miniator switch now we will install the output terminals from three-phase electric motors and finally we install the alarm output terminals by connecting the alarm to these two terminals when the power is cut off these terminals are organized and the alarm sounds in this section we do the wiring of the emergency switch the phases enter the switchboard from this place and the phases from the city electricity enter here and the phases from the emergency electricity enter here C electricity is connected here and emergency electricity is connected here and from here the electricity inters the electrical panel [Music] [Music] sh now install the switch in its place if the switch is set to position one city electricity enter the electrical panel and if the switch is set to position two emergency power enter the electrical panel city electricity in the electrical panel from the red Terminals and the emergency electricity ENT the electrical panel from the gray terminal for for now we connect the three input phases to the electrical panel to the rccb switch that's that now we connect the input three phases to the three-phase rccb switch to be used from three-phase electric motors now we connect the null wire each rccb switch needs a null wire so we do this at this stage now we wire the single phas outputs for for yeah St for both miniator switchs are connected to one rccb switch and the nle of each is taken from its own rccb switch now we are wiring the output of the three-phase contactors for this we pass the wires through the holes of the current controllers and connect them to the output of the contactors in this case if the AIS current pass the circuit will be cut off for now we connect the input wires of the conductor to the rccb switch we also connect the three-phase wires from this switch to the phase controller in this case if one of the phases is caught the circuit will be caught and the electric motors will not be damaged now we connect the input phases of these single phase switch that now we connect the output wires of these singlephase switch now we are going to install the single phase soet for in this section we connect the null wire to several devices that need null in this part of each rccb switch we connected one phase to the phas controller by doing this when one of the keys is cut off the pH controller is disabled and send the warning message this part of the wiring is finished the continuation of this video will be uploaded in the next 3 days thank you for your attention"

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"VideoID": "466",

"Title": "Drilling Into Studs for Electrical Wiring | Tool Lab | Ask This Old House",

"URL": "https://www.youtube.com/watch?v=JYycB8TcYOc",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] so today I want to talk about the proper tools and techniques that you're going to need when you're drilling holes in your home for running electrical wires now I know it probably sounds fairly easy to drill a hole as long as you have a good drill sharp bits you can drill an easy hole but when you're running electrical wires through them there are some codes we want to follow as an example why if we drill too close you can run to an issue like this you don't want to damage the wires so when it comes to drilling out holes in a new home or an addition when you have the wood studs there are typically two types of drill bits that I'm going to use one might be the auger bit and this is going to go into a drill like this that's meant to drill a lot more holes the advantage of this is has a self-feeding bit on the top stays sharper longer Meant to hit a couple of nails which you're probably going to run to in some of those studs and just holds up and makes the holes much easier lasts much longer if I have to drill a hole for adding a receptacle or trying to fish a line in I only need to drill one or two holes I'm going to use a spade bit the spade bit this particular one does have a cell feed bit some don't it's up to you uh it's meant for drilling a couple of clean holes and smaller tighter locations and I'm going to use this drill now when it comes to making these holes a straight bit isn't always going to be the right answer sometimes you have to work around a corner or a tighter space and that's where some of our accessories come in in those cases we can use an assortment of extensions a right angle adapter even some Oddball flexible bits that can help you get around some of the corners that you can't get to easily and finally in some of the tighter areas if we have blocking in a wall that you can see there's some tighter areas to get into we're going to use something like this we have these long flexible drill bits that let us snake up walls so that you normally wouldn't have access to without damaging the wall all right so let's go over one of the biggest rules that we have when it comes to drilling holes for wires and that's the clearance from the edge of a stud so for us the code minimum is an inch and a quarter we want to be an inch and a quarter away from any of these edges so as an example when we have a two by four like this we want to be an inch and a quarter in here and we have to be an inch and a quarter away from this Edge and as you can see that's the spot we have to drill now in theory that should be exactly an inch but the studs are slightly different and I'm not good enough to drill exactly in the center every single time with a one inch bit so the best practice is to step that bit size down maybe drop down to a three-quarter inch bit that can go through those that way you don't sit there and measure every single stud each time to find the exact center and get close enough with your eyeball but when it comes to a two by six stud like this we can still use that same bit maybe go up to a one inch bit and we know roughly where the middle is going to be we have plenty of clearance with this it's easier to drill so let's go ahead and show you if we use an auger bit how we do this now for me we know we have our inch and a quarter minimum clearance but I also like to keep everything the same height it makes it easier for a point of reference if you need to cut anything in if someone's drilling something outside through a wall you know where the wires roughly run and the quickest and easiest way I found for me it's right about here on your leg it's a good point to be at it makes a good point to kind of guide this through if you're having a tough time if it's older Lumber and it's not as easy to drill and it just gets you in about that right spot so I'm gonna put the glasses on let's go ahead and drill a couple holes [Music] [Music] foreign [Music] go to the corner you can see that we can't quite swear up the drill because the bay is not full sized all right so let's take a look at some of the options that we have so for this drill they do make larger bits and they do make extensions we could use something like this or a different bit but you can see even if we put this on with that smaller bit we still made a hard time getting into that spot it's great for some applications not for everything so we have some other options the next option what I tend to use in some of these Corners I'm going to go to this drill I'm going to use the spade bit that we spoke about earlier so what I'm going to do is I'm going to take the right angle adapter put it into this and this is how I'm going to fit into that bag comfortably when it's a little too tight now you can see that this angle fit in this Bay pretty well that's not always going to be the case sometimes the stud's going to be a little further over and you're not going to have room for this to fit in that's when the other accessories come into play that's when we start using things like the extensions you don't have to use them one at a time you can stack them together so a good little trick to do if you have something in the way you can always put it through the existing hole ahead of time that way you can square right up to that stud and drill it nice and cleanly so for the final hole in this corner we have plenty of room to fit a conventional drill and spade bit in there now that we have all of our holes drilled it's time to go ahead and pull the wire and this is where having them all the same height really helps us out makes it much easier to pull everything through nothing's getting twisted up nothing's getting tangled it's a much better job let's go ahead and take a piece we're just going to roll this out foreign and start pulling it through this side nice clean hole simple enough and then we get to the corner and this where it gets tricky sometimes now in this case it's not too too bad because we have a two by six on this side and a two by four on that side giving us a fairly large Bay but let me show you how this actually works since we can't bend the wire inside here we're going to bend it by pushing it against this back wall so when I go through this hole here's what's going to happen I'm actually going to push it all the way in I'm going to push it up against the back of the sheetrock and just gently wiggle it till I feel it starting to get a curve and what's going to happen it's going to get a curve like this and because it's wire it's going to hold its shape so when it's inside that bay has that curve I pull it back and our holes are lined up it makes it very easy to line up here I can just slide my finger right here touch the end of it with a little bit of pressure pushing forward and pulling back I'll pull it right through that hole so let me show you Let's Straighten that back out going to go ahead and put it right here just push it forward a couple times to give it a little curve and just like that comes right through and as you can see we pulled it all the way through very simply now let's say you had a corner that was much tighter a couple of two by fours or the holes weren't perfectly lined up and you had an offset there's another trick to get around that as well so we have this sitting back here we can't quite make the corner I'll take a single piece of that wire about this big and what I'll do is I'll put a little curve in it just to get it started and I'm going to use this like a fish I'm going to start in here and just try and make that corner and as you can see that goes through a lot easier than an entire wire you'd simply tape that on and pull that through and that would get you through so these are some of the tips and techniques showing you how to drill holes through a framed wall to pull a single cable on how to deal with some of these Corners you might run into now if you're going to be running multiple cables you can increase the size of the hole to a certain point But realize you are limited by certain factors such as your clearance from The Edge and how many cables you're going to pull through there you're only allowed to pull so many so make sure you check with your local inspector to see what you are allowed to do with that being said and we're talking about some of the code issues you may not always be able to get that clearance of an inch and a quarter from The Edge that you want to get and there is a solution for that worst case scenario you can always throw up a nail plate to cover that space and keep that protected okay and that'll solve that situation and that'll keep us from having a straight nail or screw go through there and potentially hit that wire and just remember for making these jobs easier it's always great to have the right tool and sharp drill bits to help you move along thanks for watching this whole house has got a video for just about every Home Improvement project so be sure to check out the others and if you'd like what you see click on the Subscribe button to make sure that you get our newest videos right in your feed"

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"VideoID": "467",

"Title": "Running My Own DIY Shed Electrical Wiring! - (PART 1 of 2) - Thrift Diving",

"URL": "https://www.youtube.com/watch?v=Ia3\_7BVD--A",

"Keyword": "Electrical wiring installation",

"Transcript": "oh my gosh guess what today is we are finally starting the electrical work in the shed you have no idea how long i've been waiting for this i had some projects that i needed to get done first but now it's all about the electrical baby so in this video you're going to get to see it's probably going to take about a week so it's going to be a week's worth of content that i'm going to squeeze into one little video and i'm going to show you the boxes i'm going to show you the wiring i'll show you the ditch digging that the landscape people are gonna do i'll show you all of the electrical in this one video and remember this is not just me being a diy-er deciding that i want to wire my entire 16 by 26 shed i'm actually under the advice of a master electrician so he knows what he's doing and he's going to make sure that i know what i'm doing and as i learn you are going to learn today's video is being sponsored by my friends at ariat they are the official clothing sponsor of thrift diving i'm telling you even when i'm not doing videos i'm usually wearing this stuff this clothing so i'm going to give you a little bit of information about that and why i think you should also have some area in your closet because these these pants are freaking awesome i've got pockets for days this clothing by ariat really isn't just about looking good but it's about being able to work and move freely without the snags and tears and being able to keep your tools near by you you know i do a lot of hands-on projects and i need hard-working pants and i'm also very careful about what i wear on my feet when i'm doing diy projects so i make sure that i'm wearing composite toe boots these are going to protect my toes in case something like two by fours fall on them so these kc six inch composite toe work boots these are my favorite they look great when they're clean and they have protected my toes now if you click my link below you can find a link that goes to serena's favorites that's my page with all my favorite area clothing that i personally pick and wear and you can save ten percent on your first order with the link below now if you want to see all of the rebar line of women's clothing and gear you can just click on women and then click underneath clothing go to work where and see what else that they've got in the collection now i can tell you there are a few more pieces that i want to add like this really cute pink dura stretch fleece i'm loving this so right now they're having this huge black friday sale on many items so click below check out the sale before it ends in a few days and be sure to look at some of my favorite things okay let's get back to this project down in the description i will leave links for each of the different chapters of this video so don't feel you have to watch the entire thing all the way through but if you did i wouldn't be mad right here you see that i've got some blue painters tape here what i did after making the plan on the ipad was to try to go through and figure out okay now that i know where i want things to be let's take some tape and mark them and this is about 16 inches which is good i want to be able to put stuff on the workbench and not have the electrical get in the way so this is going to be one circuit so over there that side is going to be one circuit over here will be another circuit this is where the mini split is going to go so it has heating and cooling capabilities the sun shines directly on the front of the building so it's going to be hot in here if i don't have the proper heating and cooling and i gotten some tips from from some woodworking friends who said if you have a shop do not put your outlets your receptacles down low because if you have sheet goods most likely there's going to be walls where you're going to be standing those sheet goods up on its edge and if so you want to put those receptacles anywhere from four and a half to five feet up high so this entire wall over here will be on its own circuit for this front wall i've got one exterior light here one exterior light here those are going to be on its own circuit with the two ring actually no there's going to be three ring flood security cameras so now that we're almost ready to get started with installing these boxes i wanted to point out to you that i'm going to be using this professional laser leveler and when i turn it on you'll see it shoot a green line vertical and horizontal as well so the horizontal is what i'm most interested in because i want to make sure all these boxes are going to be level i don't want one of them up here the other one up here because you will be able to see that they're not level and straight this green line is going to help us keep everything even and so i just need to pick a point maybe the top of this box if that's where i want it to be i'm going to take some drywall screws and attach that i'm actually not even sure how many drywall screws maybe i need four now not all boxes are going to use drywall screws you see the one gang boxes the gray ones those ones have nails attached to them which make it really easy to put it right up next to the 2x4 it's got these little tabs i guess you could say on the side of the box so that when you place it on the 2x4 you know exactly where it needs to go so when you put your half inch drywall then the drywall is perfectly aligned to that box right because otherwise your box would be inset too far or it would stick out too proud and that's not what we want so when you have those little tabs on the side it makes it really easy to line it up right there on the 2x4 hammered into place and you can keep going you can see the tabs right there and that's where you line it up and i should have gotten a close-up but of course sometimes i'm moving so quickly there's some footage that i just forget to capture anyway i put the two gang box over where the light switches are going to be and i'm also doing some receptacles in the ceiling actually i only plan to do one but ended up doing three and i did put some of the receptacles down low for the places where i knew i needed to have a receptacle close to the floor okay guys so day one is done i got all the boxes in it was a lot simpler than what i thought i mean i guess i didn't think it was going to be too difficult but everything for the most part looks like it's straight i made a little bit of mistake in the beginning i put some of the two gang boxes the blue boxes down below underneath the workbench and i realized those were supposed to be for the switches so i ended up making a change with that and put the one gang boxes underneath went through added two more to the ceiling because before the way i had it designed only had one here in the middle for a workbench but i realized i may want to work over here i may want to work over here and i honestly don't want a lot of cords running along the floor that's where you start tripping so now i've got a couple of a couple extra ones one at each side of the room so if i decide that i want to move my workbench over here i still have a cable reel that i can pull down so super excited everything's coming together but for the most part things are going great so when it was time for the landscapers to come i set up my camera and recorded all of it unfortunately they only went down 21 inches and they were supposed to go down 24 inches so i ended up having to call them back to dig another three inches by hand but it was about 450 i had considered doing this part myself but honestly the cost for me to have somebody come versus me renting the machine and having them deliver because i don't have a truck or you know something to tow this heavy machinery it was going to cost me more money than to just pay a landscaper to come do it so once everything was done it was looking pretty good and this is where all the cables from the house to the shed will be buried and we'll also be doing conduit so if i've got xfinity or verizon coming i'll be able to get the you know the appropriate connections so that i can have internet in my shed the brand of lighting is progress lights progress lighting and this is ic rated which means once i have insulation around here it's fine it's not going to heat up these are adjustable so you can make it as wide as you need it of course why is this one stuck for the lighting i'm going to be doing color changing lights because during the day when i'm working i want it to be nice bright actually i may not even need the lights during the day but at night time if i'm working on something i may want it to be warm i want it to be cool and then i can change the lights via the app yeah it's gonna be pretty cool i measured 39 inches from the center of the truss down the truss and marked it and this is the measurement that i used to make sure that all the recessed lights were evenly spaced and i wanted to make sure there was five and a half no actually it was five and a quarter inches from that center mark to each side and that's the measurement i used to make sure that they were centered and i discovered it was easiest to have that recessed light pushed to the side that i was hammering because it made it more stable and once that was in place i moved it to the other side again centering it five and a quarter on each side and making sure that that was hammered in place and then moved it to the center once i figured out how to do it it really wasn't that difficult so the first one was was a little shoddy but all the other ones turned out very well and i ended up using 10 lights people had said well why are you doing recess lights why don't you do the kind where you just cut a hole in the drywall and plop it in there i figured since the ceiling was already open it was going to be easier for me just to do the recessed light and other people have said well also you're going to probably get some shadows with these recessed lights why don't you do the four foot workshop lights honestly i didn't think those were going to look as nice in here i really like the look of recessed lights and i think most of the work i do is going to be during the day when i don't even need light and at night time these are going to be plenty of light i i don't really foresee it being any worse than what the garage was so overall i love the look of these and it's going to work out just fine before i could start running the electrical wiring i needed to put these two by fours on the gable ends of my shed the reason why i was twofold number one there was nothing for me to attach the drywall to so without having something there to put the drywall screws in it would have been nearly impossible to finish the ceiling off with drywall and secondly by putting this two by four there i could run my electrical wires up and over those parts knowing that it was safe and secure from being you know where the drywall was was going to get into the way so that's what i did and i tried to make sure that it matched the same pitch of the roof trusses i think i did a pretty good job but we'll see when it's time for that drywall to go up that's going to be the real test now because all of my receptacles are going to be 20 amp they're going to use 12 2 romex which is the yellow wiring and the 12 is for the thickness of the conductors and there's two conductors inside there's a black one a hot and a white neutral and a ground but they don't count that now i'm going to be using this special bit that will chew through those two by fours when i have to drill holes and you'll notice it's got this little screw tip i'll explain why this is important so now that i have the boards up the two by fours on the walls we are ready to start running the wiring i have to admit to you i am actually very nervous about this part but for the most part i feel comfortable in knowing what i'm doing the wire this morning that i unhooked it was very cold and stiff because i forgot i left it in here so i took it inside now it's got a little bit of bendability do not leave your wiring in the cold shed where this blue rectangle is this is going to be the sub panel so everything has to originate at the sub panel and then fan out to all the places where electricity has to get to and the way that we figured out how we're going to do the circuits is that this section right here will be one circuit straight up drill some holes come around hit this box here and then hit this box hit this box bring it down below and there are two receptacles there's two receptacles there and then i can hit this like this last one we're gonna have one there's one up here in the ceiling for the air filtration so that's two there's gonna be two receptacles here so two outlets in each one so that's four five six seven eight and this is going to be nine so that's well below the 12 but what i'm trying to figure out is where do i start the main thing is that we want to make sure that we're right in the middle of this two by four stud i'm using a three quarter inch paddle bit here and the other ones actually they didn't work with my drill so this is what we're doing we should be right in the middle later i ended up getting a impact driver which worked perfectly well with the other bit that i showed you just a couple of minutes ago the paddle bit i mean it worked but you see how slow it was and i had to push on it whereas if you're using the bit the auger bit that has the little screw tip it literally will pull it through while you're i mean look at this i'm still drilling it'll pull it through while you're drilling and it you'll see in just a moment it takes no time at all when i started getting through to the other side i would switch over to the other side and complete it so that i got a nice clean hole otherwise i noticed that i got a lot of tear out on the back part and i just you know even though this is going to be covered up by drywall i still wanted it to look good and there were times when i had to drill at a corner and so you'll see that i'm doing a hole on each side i'm also using a different tool because i had to drill this when there was not 16 inches on center it was a little bit more narrow we're going to actually pull from the center here i think i probably should have left the plastic casing on it but didn't know that until after the fact but we are going to pull from the center and we're going to try to straighten this out because otherwise it's just going to get too coily and when you're pulling that wire through be mindful of the direction of the wire because before you know it it starts to twist on you and once you have it run the full length of wherever you're pulling it to it's very difficult to get it twisted back in the right position so just be mindful of that okay so we've got 12 inches here this has to be connected within six inches of the box we've got a drilled hole here in the double top plate and according to my electrician we need to keep at least five feet of wires right here where the panel is so i'm five nine i'm just going to go ahead and use my wingspan to determine so we're going to cut it about here i've got my lineman's pliers we're going to snip that and now we can take this piece and run it from here to the next one so essentially what you're doing is you're daisy chaining your receptacles together so with that first wire in place all i had to do was run another wire to the one that you see that's connected and then getting around this corner i just created a right angle pulled it through the holes that i previously drilled and made sure again that it wasn't twisted and you see i'm getting twisted up here it can get away from you but remember this with electrical wiring you'll have a wire that's coming into the box like you see me doing now and you'll also have a wire that's leaving the box that's going to be the case for most receptacles okay the good news is that we've got the first circuit run we are coming out of the box we ran it all the way up here to the box that's going to be in the ceiling this is going to be for the air filtration and then we're just literally daisy chaining so we're putting another wire in there we're coming over here to where we drilled a hole and we're coming down to this box and then once we hit that box then i drilled some holes there through that corner all the way here to this box i hit that box connected it to this box and then you can see the box has another wire going all the way down to underneath once i got underneath i added some additional holes there going over to this box hitting that corner coming down and hitting the last receptacle that's in that circuit now it's time to do the second circuit and what i'm going to do is i'm going to put another conductor another piece of wire up through that same hole that i bored for the first circuit but i'm going to bring it all the way around on top of that 2x4 because it's going to be above the ceiling so i'm not going to have to drill any holes up there i'm going to come all the way down and then i'm gonna drill a hole right here in this top plate and come down and hit this first two gang box so there's gonna be two outlets here so that's two four six over here and then i've got two down below so that's that's eight and really all you're doing is you're just daisy chaining them together so when i start pulling the wires over to this first box that's the first box that is in the you know in the circuit right so it's going to start here so there's a wire coming in here and then there's going to be a wire leaving here coming over to this box and then that wire is going to come in but then i also have to connect it to the next box so there's a wire that's going to be coming out over to this box until you get to the last box there's two underneath and then that's it that's the circuit and it all goes back to the sub panel where it all gets connected and and yeah so what we're doing here is we're putting all of the receptacles on their own circuits and then the lights there's 12 recessed no there's 10 recessed lights those are all going to be on the their own circuit right so if i trip a let's say you know for some reason i'm using this i plug it in and the power trips well if i'm in here in the dark i don't want my lights to trip so having your receptacles on one circuit and then having your lights on another circuit helps to keep things separate just in case you do trip something and your lights aren't going to go out you want to be able to see what you're doing i didn't realize i could use my trusses and go straight across the trusses you see i've got that little 20 degree angle there where the trusses are sitting on the double top plate i could have run my wires through them but didn't realize that so i ended up using a lot more wire than i needed to but that's okay i actually bought a different auger bit and switched to an impact driver and oh my gosh this thing just chewed through the two by fours so quickly i couldn't believe that i had done two of the circuits using the old you know three quarter inch paddle bit this was perfect oh and just to think i was using that little spade bit yesterday this is so much easier oh my gosh the mini split has to be on its own circuit so i drilled those holes from the sub panel to the location of where the mini split most likely will go down the road circuit for the mini split this is going to be on its own circuit and we're just going to run it straight through instead of going up and around this will help save some some wiring because this stuff is expensive now my electrician did tell me that because these walls are getting drywall then this height of wiring is fine but if i was leaving this open and didn't plan for drywall this wouldn't be allowable by code because they look at it as well this wiring could get damaged so just something to keep in mind know your local codes i also didn't know that i could go through the trusses and have the trusses support the wiring so there were times when i was trying to wrap it around the trusses when i didn't need to so extra wire was used that probably didn't need to be used but you live and you learn i was nervous about cutting the two exterior receptacles i created a template and then used a marker to outline at least the first one i thought that was pretty helpful because i didn't want to make a mistake so i'm using a level it drives my electrician crazy when people put in receptacles and they're crooked so i did not want to disappoint him so i drilled a pilot hole took my jigsaw cut that out very carefully and then found that the box fit in there pretty well this is the box that when you start tightening up those little screws there then it'll hold to the shed so you know it'll be secure the other one i cut out just a little bit bigger it fit in there fine but it was a little bit more loose i didn't like that but it's even so it looks pretty good and from behind you see that it's captured right there with that little clip it's not going to fall out all right so once that was in place i was able to run the wires from the top receptacle down to where the exterior one will be and then i just continue running the cables to create that circuit that is going to be on that side of the wall the main thing that i have to do now i've got two circuits left to do which is just the lighting so if you remember we've been using this 12 gauge well it's 12 2 which means it's 12 gauge and the conductors inside there's only two and a ground wire so now we're going to be switching to the 14 gauge which is white and we're going to be doing all the lighting that's the last of the two circuits that need to be done i'm going to run a cable a wire from this sub panel all the way up and i'm going to hit this ring security camera first from there i'm going to come over and hit this switch and then from there i'm going to bring my cables up and i'm going to hit over here which is the second ring light once i hit that one i'm going to come over here hit this switch and then i'm going to run the cable from here up to this third light and then from there i actually need to connect another wire from this box to the light that's going to go here and then i've got to attach another wire from here to hit those lights because that switch will operate that light and that light and the last circuit that i have to do is for the lighting you remember earlier in this video you saw me do the recessed lighting installation so those have to be wired with 14 to cable and what i'll do is run a cable from the subpanel and i'll probably go up here along the trusses up here you know above where the drywall will be and i'll come over and hit this switch first because remember anytime that you're doing lighting that will have a switch you have to get the cable to the switch first before it can operate your lights what i'll do is hit that switch first and then i'll bring it up and hit one two three four five and six and that will operate on that side with that switch now i think the next thing that i have to do is to run another cable from this switch over to this switch and then from this switch it needs to go all the way over here to this door now this door is where i want to have a three-way switch these lights there's four over on this side one two and there's one above my head and the other one is there these four will operate on its own switch so once the power is here and i've got power over here to this switch then i can run it from this switch up to these four lights and that means whether i'm coming in the front door or whether i'm coming in the side door i will be able to operate these four lights from either door it won't matter because i have a three-way switch man this has been a long video and guess what i'm just gonna stop it right here because there's so much that i've already shown you that i don't have time to put in part two so what you're gonna see in part two is you're gonna see all the connections you're gonna get to see the rest of the wiring and the lighting and also next week the electrician is coming super excited about that he's going to make all the connections in the subpanel he's going to bury the conductors from the house to the shed and you'll get to see all of that plus probably part of the inspection so that's just part of it that's part two but part well i say part two of the electrical but part three and four and five and six you're gonna get to see all of the insulation the drywall the flooring all of that still coming lots of work to do remember this video is being sponsored by ariat guys if you are someone who loves clothing that's very comfortable that actually helps you like keep your tools nearby when you are working you have to get some area clothing i love this these pants are freaking amazing and right now there's black friday sales that are going on and down below you can find my link where you can go and access all the things that you saw in this video yes i know i'm such a good ariat model anyway seriously you're going to love this stuff and you can get all those deals down below for black friday and it's a limited time so if you want those deals you got to shop now so use those links down below come back again for the next video and i will see you next video"

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{

"VideoID": "468",

"Title": "Jon Boat Electrical Wiring for Beginners and DIY&#39;ers",

"URL": "https://www.youtube.com/watch?v=5qaA\_0eDQa0",

"Keyword": "Electrical wiring installation",

"Transcript": "let's do this intro old school late night tv commercial style do you want to do your very own john boat wiring but you're not sure where to start are you scared of electrocuting yourself possibly setting the boat on fire and maybe even sinking it to the bottom of the lake are you frustrated trying to figure out which wire goes where and how to connect all this stuff and make it work in your john boat don't you worry because i've got just the product for you introducing senate john boat's complete wiring guide video series for dummies idiots and people of adult age that still eat crayons all you need to do is grab one or a combination of any of the following items that you use for coping with your anger regret and a long list of bad life decisions plop your little happy chocolate starfish down on a couch and watch this video now while we can't guarantee that you'll be a pro boat wire after watching this video i can promise that you will get to see me wire this boat you may laugh a little and if i get shocked at least it'll be on video for you guys to enjoy maybe send it disclaimer for the haters trolls and everyone who pushed paws on their pokeman game so that they could take a break and temporarily become a professional boat builder because we all know there is nothing worse than boat wiring videos for bringing out haters trolls and comments so with that being said if you go and read the comments of this video everything i'm gonna do is wrong but what those haters in the comments don't know is that i've watched four entire youtube videos about how to wire a boat so i'm basically certified to do what i'm fixing to tell you how to do so with that being said this is my boat and i'm wiring it the way that i want to if you want to see it stick around and if you don't like it you can go to the other side of the internet i'm sure somebody right now is making a video of someone shooting ping pong balls out of their butthole and as interesting as that sounds we have got to go wire this boat let's show you how to do it let's run through everything i'm going to be using to build this electrical system for this boat and all of the links to the products that i am using are going to be down in the description box below you can get them either through tinyboatnation.net if you want to use a promo code i'll leave it right over here you get five percent off on all your orders at tvnation.net starting off with our battery disconnect this is just a basic one off one on battery disconnect i am gonna be running two batteries on this boat but i'm gonna have them both hooked together for my 12 volt system so we only need one battery disconnect next up is going to be the fuse for the trolling motor this is a 60 amp and it's got a little push button reset on it if you need to do that then we've got our power distribution block that is also a fuse panel built in and i've only got six circuits that i'm going to be running on this boat the electrical system is pretty simple so this one has six areas to put six different circuits and six different fuses and we've got our switch panel this one features six gang switches that all light up and they come with little stickers so you can put on there what exactly each switch does got a volt meter so that you can keep an eye on how much voltage your battery's got this is a regular like 12 volt cigarette outlet right here and then this one over here is for double usbs so what all are we going to be powering on this boat first up we've got our trolling motor it is already mounted on the boat but here is the plug that is going to be used to plug and unplug the trolling motor power we got dual 800 gallon per hour bilge pumps i've got some courtesy lighting that i'm going to be putting underneath the deck so we can see up underneath there and some along the runners on the floor so that you can see at night we've got our anchor light for the rear of the boat and a plug for it to go into and then out on the boat i already have installed headlights that are like led bars that are built into the front bumper we'll look at those in a minute and i also have the front navigation lights which are led strips kind of like this and they are already mounted on the boat and last i haven't decided if i'm going to install these or not yet but i have these like rope led lights that you can mount up underneath the catwalks and they change all kinds of different colors and make your boat look like it's a freaking nightclub i don't know if i'm going to install these or not yet but i have an extra circuit for it just in case i decide to do it far as wiring goes for the boat for the main battery and the wiring that we're going to use for the trolling motor we're going to be using marine grade 8 gauge wire i've got it in red and black for positive and negative and then everything else on the boat is going to be done with this 16 2 duplex anchor marine grade 16 gauge wire i went ahead and bought a huge spool of it because i've got several boats to wire but this is what everything else in the boat will be wired with so a little bit about the wire itself i get asked all the time do i have to use marine grade wiring or can i just use you know automotive wire or whatever they sell at walmart home depot extension cords all that kind of jazz first let me explain the difference between this marine grade wire and regular copper wire i'll give you my opinion and then you can make an educated guess for yourself which one you should use regular copper wire like this that's used in automotive applications and the wiring in your house and extension cords and things like that are usually just multi strands of plain copper bare copper and copper alloys that are used in you know regular wiring like this are not exactly water and moisture friendly if you use regular old stranded copper wire like this in your boat at some point in time it is going to come in contact with water probably sooner than later and at some point that water is going to start to corrode this copper and then it is going to lose connection or cause you to have connection issues so in the boat industry a way to combat that is one get rid of that wire and they've come up with their own wires called marine grade wire and each strand of copper wire inside of the marine grade wire is tin the tin coating helps give it more resistance to water and moisture humidity things like that and helps keep it from corroding and having connection issues later on down the road another fun fact and kind of cool thing about marine grade wire is the strands themselves the individual strands are usually a lot thinner than an automotive grade wire or in household wire and there's more of them which gives it more surface area and thus a better electricity flow also because of the high strand count and the strands are thinner it allows it to be a little bit more flexible than regular wire which comes in pretty handy because there's some tight spaces on a boat that you've got to bend this wire the big downfall to marine grade wire is it's expensive just doing a quick amazon search here a 100 foot spool of 16 gauge marine wire or only about 19 bucks and searching for regular automotive grade just copper stranded wire i couldn't even find a single 16 gauge roll they sell it in double rolls and one red and one black and it was cheaper than buying just one roll of this marine grade wire when it comes to marine wire i usually always guesstimate that the wire is going to cost me about 25 to 50 more than the equivalent and regular stranded copper wire so my opinion can you use a regular old cheap copper-stranded wire to wire your boat yes should you i wouldn't at the end of the day the decision is up to you but there's so much expense that goes into boats i can find other ways to cut costs and splurge a little bit on the wire and know that i don't have to worry about it for a really really long time so another question i get asked a lot about the wiring on boats is what size wire should you use well the internet will come in handy because there is a handy dandy little chart you can find on google that'll tell you exactly what you need to know if you jump on the interwebs go to google or duckduckgo or whatever you like to use type in a wire gauge chart or marine grade wire chart you can find a ton of these little charts right here that will tell you exactly what size wire you need aside from your handy dandy chart you'll need to go through each piece of equipment that you're going to be powering up on your boat and figure up how many amps each individual thing runs the other thing you'll need to know is how long of a distance that you've got to run that wire because that is what is on this chart if you look on the chart up at the top from left to right it reads length of conductor which means length of wire that you're going to be running and then down the side from top to bottom it goes total current in amps on that circuit so let's just take the led courtesy lights that i'm going to be putting in this boat all four of them together pull a half of an amp well a half amp isn't even on this chart the lowest we've got is five so we go to the number five line right here for five amps and i've gotta run approximately 15 feet of wire so we go over here to the 15 and meet in the middle and it shows you that you can use 16 gauge wire for that circuit pretty easy pretty handy little chart print it out and keep it around your shop or look it up before you build your boat and you'll know exactly what size wires you need to buy wire coloring doesn't really matter it's completely up to you i personally like red for positive or power and black for negative or ground just my personal preference i've always done it that way you can use whatever colors you want and in this video you're going to hear me use several different terminologies for red wire for me is going to be positive or power or hot wire and for me black i say ground negative earth people use a bunch of different terms but they all kind of mean the same thing for most of the connections on the boat i'm going to be using this new kit that i've been using for a while now i actually really like it these are called solder seal connectors what you do is take your wires and you twist them together inside of here slide this over and then you use a heat gun to actually heat this up and this is solder right here and it actually melts and coats both of the wires to tie them together real quick and then this has got some kind of crazy glue inside of it and the glue actually melts to help hold the wires in place and then seals it up real nice and tight i bought this recently to do some work on the electrical on my truck and these things are like really really handy i'm actually really liking these i also got some heat shrink in different sizes i'll probably use it for a few connections for the fuse panel and switch panel i've got two bags of different size blue connectors these are for 14 to 16 gauge wire i've got ring terminals and then this bag is male and female flat and spade connectors and then i've also got some ring terminals with the heat shrink already built into them so those will come in handy for hooking up to the battery and our main disconnect starting with our switch panel let's go ahead and do a couple of things to it they come pre-wired and this is basically for your average joe that doesn't know anything about wiring what they want you to do is tie all three of these red wires together put that on your positive of your battery take this black wire put it on the negative and if you want all the lights to work on the switches you can hook up this blue wire too we're not going to do that so i've removed all these power and fuse wires from all the little pigtails and daisy chains that were on there we can get rid of those we do not need them we have our own fuse block so we don't need any built-in fuses all of this pigtailed wiring for the grounds we can leave it in place that will be just fine and all of the blue wires are for the accessory lighting on this switch basically on this side there is a green light that goes in this little line right here we want those to light up at all times and then when you turn the actual switch on this little green light will come on and then when they turn it off this light will go off but these will always be illuminated whenever there's power from the battery these lights are totally optional you do not have to run them if you don't want to run them all you need to do is just take all these blue connectors out and throw those away so let me attempt to explain how this is going to be wired it's fairly simple but if you've never done wiring before i can understand why this would be really confusing and a really daunting task it's really not in simplest terms what you're going to do is you're going to take your two battery wires your negative and your positive you want to connect both of these to the battery with a ring terminal and then the other end of these what you're going to do is you're going to take your black ground wire and you're going to hook it to the negative post right here on your fuse block your positive post of the battery is going to go into one side of your battery disconnect so it'll come right there then you're going to cut another piece of wire and go from the other side of your battery disconnect out of the disconnect and over to the positive post on your fuse block you're also going to want to take another power wire and hook it to the other side of your disconnect and run it over here to your trolling motor fuse on the opposite side of your trolling motor fuse you're going to put a wire here and that's going to run straight to your trolling motor your ground wire from your trolling motor is going to come and connect right here to your fuse block now as far as wiring the rest of your accessories you only have two things your fuse block goes first and then your switch panel so let's use this bilge pump for example we're going to wire up power and ground to this bilge pump what we want to do is we want to take a power wire and run it from whichever circuit i want to be my bilge pump circuit the power wire is going to go from here to the bottom of this switch now depending on which switch panel you get one of these two is going to be the input one's going to be the output so this is going to be power going in and then power going out to in our case the builds pump so we'll run a power wire from the fuse to this lower one here and that's going to give power to the switch and then we're going to take our positive wire from our builds pump and it's going to connect to that top one right there on the back of the switch now your ground wire from your bilge pump does not go to the switch panel it is actually going to go back straight to this fuse block right here and this fuse block has a ground bar right here for all of your ground so you can connect each one of your grounds individually it will all go to here and this runs back to the battery gonna pop in here real quick and cover one more question that i get a lot about wiring boats and that is where do you ground the battery or are you supposed to run a ground wire to the hull anywhere and the answer is no no no no no no no oh my god no everything that is powered by the battery in your boat needs to end at the ground post it needs to go no further than that you do not need to run a wire from the ground post or the negative post on your battery to anywhere on your boat nowhere ever nothing you do not ground anything to the hull of your boat on an aluminum john boat if you do you're going to be running electricity through the hull of your boat make it conductive and start this really cool process called electrolysis for those of you who don't know electrolysis is a method for rust removal on steel and since aluminum is softer than steel and it doesn't rust it oxidizes it will literally eat itself away especially if you put your boat in any kind of brackish or salt water so yeah don't ground your boat don't ground your power system to your boat don't ground your battery to the hull don't nothing just everything's going to be powered by the battery and all that power is going to run right back to the battery and leave it at that doesn't matter if it's a 12 volt 24 volt 96 volt 5 000 volt system do not ground anything to your boat hole got it all right so our next step is to build us a panel to put this in the boat now depending on your boat and how your build goes this may look different for you you you may mount all of your fuses and your disconnect and stuff inside a hat somewhere and have the switch panel you know to where you can get to it mine i'll show you where it's going to be in the boat here in just a second but i want to go over the basics of building this panel so the panel itself is just a sheet of aluminum i believe this is .050 it's not very thick but it's just enough to hold all my stuff in place i laid everything out where i wanted it marked all of my screw holes pre-drilled a hole so that i could mount all this stuff in place you will have to cut out a big square here i just used an angle grinder so that i could put my switch panel in and now everything is screwed down to this aluminum panel so i went ahead and started here on the workbench with what wiring i could get done so it'll minimize how much i have to do once i get this in the boat so from the battery disconnect i've got two power wires going out i've got one that goes to one side of the fuse for the trolling motor and the other one goes right down here to the positive lug on our fuse panel now using a ring terminal just like this i made wires to go from each side of the positive blocks on this fuse panel to run around to the back side to go to each one of these individual switches so if you follow these wires around to the back side we'll be able to see exactly what they're hooked up to all of these wires right here ignore this one for right now i'll explain that one in a second but all of these wires are what is going to the actual switches i told you guys wrong earlier actually i went back and looked at the wiring diagram all the wires going from the fuse panel so your input power to each switch needs to go on this middle one right here and then this one is where you're actually going to connect the accessories i had them flip-flopped now what i've done up here is i have daisy chained all three of these lugs up top these are the two power adapters i think this one is for the cigarette outlet and this one is for the usb and then the one in the middle is the voltmeter so i went ahead and made me a little daisy chain to go from each one and then i ran one power wire out now if you trace that power wire back around to this side and i doubled it up on this lug right here so it doesn't really matter which circuit this goes to the reason i picked this one is this is for my led navigation lights on the front they don't pull hardly any power and this stuff up here doesn't hardly pull any power so i just combined them and put them all on one circuit then back over here to the back we left all of the black wires in place and i'm still not sure if i really want to hook up this blue wire or not i did look at it i mean it looks cool and all but i just don't really see any reason to have those little bottom lights on the switches right here lit up all the time when the battery's on this is going to be inside of my hatch so i'm not even going to really be able to see this anyways and i'm just really not worried about it right now but i'm going to go ahead and just leave it in place and just tuck it back over here so that it is out of the way for now the only other thing that i've wired up on this panel is going to be the grounds so all of these grounds were already daisy chained together and it already had a little wiring harness and it just kind of stopped right here so what i did is i put a butt connector right here put some heat shrink over it and ran it around to the front and then i connected it to the ground bar right here so that's everything i can do on the workbench for now i need to take this out to the boat install it and then we'll continue on with the rest of the wiring we'll quickly go over how i do connections and some tips to help you out to make sure that you're getting good solid connections we're gonna go over the solder seal ones out on the boat here shortly so let's focus on these crimp style connectors if you have one of these tools that looks like this throw it away those things are garbage for making good crimp connections you do not want to use them go and spend the 12 or 13 bucks or whatever it is and get you a nice set of crimpers or a pair of lineman's pliers are even better the crimp on these tools right here has the correct shape that you need which is round on one side and then a little hump on this side and that will give you the correct crimp that you need to get a solid connection on this that piece of garbage just has two of these little rounded sections and it almost always gives you problems not even worth it just throw it away could get you a decent set of these crimpers another handy tool to have not completely necessary but they sell these at harbor freight they're like seven or eight bucks it's a little wire stripper tool totally worth it if you got to do a whole boat by yourself you can do all of your wire stripping up here if you want and i'll show you both ways so we're working with 16 gauge marine wire and all you do is go over here and up to 16 it's got 10 12 14 16 and on up go to the number clamp down just like this i usually pull against with my thumb and that is stripped to do it with this little tool you just put it in the tool it grabs it and pulls that off just like so so before i go and actually make my connection what i always like to do is take my wire and twist it give it a nice good twist so that it's nice and solid just like that so i go a little overboard i like to put some heat shrink on no matter what kind of connectors i'm using these are heat shrink connectors and you can heat this up and it'll shrink down and then i will put another piece of heat shrink over the top of it i also like it because it makes it look a little nicer so then you're going to take your handy dandy crimpers and right over here they have colors on them you got red blue and yellow the color of the dot on your crimper matches the color of your connector this is blue for 16 gauge and blue for 16 gauge right here put your connector in your crimper just like so make sure it's kind of lined up and in the middle and give it a good squeeze if crimped correctly you should be able to yank on this and it should not come out then just heat shrink this use a heat gun not a lighter to shrink that heat shrink up and here is why i say do not use a lighter it puts black soot all over this thing and it usually is way too hot yep that does not look good once it cools down enough then you can take your heat shrink slide it down and i like to put mine almost to the end just covering up all of the connector and then using a heat gun you can go ahead and heat this up i'm going to use a lighter just to show you the lighter does work but as you can see it left black soot all over my wire right there and i don't like the way that looks very unprofessional and remember you're getting youtube certified here so don't be doing unprofessional stuff like that all right let me give you a basic rundown on how to make connections what i'm doing is hooking these two builds pumps up and i want both of them to run on the same circuit so i've already cut my wires to length i've got this one cut and this one cut and i've got the wire strip backed about a thumbs width as about an inch or so this duplex wire is run all the way up to the front of the boat and that goes to our switch and our fuse panel what i like to do is take about five six inches of wire make a slight cut right down the middle so that you can get that duplex wire out of the way make a quick little shallow cut all the way around you only want to cut through the white outer sheeting you do not want to cut through your wires and then peel this back get that out of the way and that exposes your positive and your negative wire get your handy dandy wire strippers and strip about an inch on each side [Music] then i take a piece of heat shrink and slide it over each wire and then our solder connections slide each one of those over your wire i'm going to take both of my negative wires and hold them right next to each other and then i'm going to hold my wire that goes up to the front of the boat right in front of it just like this and then what i'm going to do is i'm going to twist all of these wires together get them pretty tight and then they end up looking something like this then you'll take your solder connection and slide it over and then grab your heat gun and just start heating this up now i hold the heat right in the middle so that i can get the solder to melt first and then i'll worry about the edges last [Applause] so as soon as you get done melting the solder and you get all this heat shrunk down it's going to be kind of sticky to the touch what you want to do is just give it a couple of minutes and let it cool off until it's no longer sticky then you can take your heat shrink and slide it over grab your heat gun and heat shrink that into place then we'll just do the exact same thing for the positive side all right for this positive side i'll bring you guys in a little bit closer so you can actually see what i'm doing up close get that wrapped up nice and tight solder connection and pull it over and then heat it up [Music] [Applause] kind of hard to see this on the video but you'll actually see the silver solder flow all around those wires once it's hot enough and then you can heat up the edges to get that glue to stick and the heat shrink to shrink up around it and we'll take our other heat shrink put it around and heat that up [Applause] and that connection is now good to go so if you plan all this out really well you can actually hide all of your wiring up inside of your framing for me i'm just running it on the top side of these two supports so it actually holds it up inside this framing and you won't be able to see it if you need to you could drill a little hole through here and stick a zip tie inside to hold your wires in place there's a bunch of different methods you can use but this is the one i like to just use the parts of the boat that i can and put the wires behind them and hide them up underneath the frame rails [Music] [Applause] [Music] so let's try to make some sense out of the spaghetti factory i've got going on over here everything is done and wired up i've just got this panel clipped into place real quick so i can show you guys all the wiring and exactly what i did this wire right here runs in from the battery and goes into one side of our disconnect with a disconnect off there's no power going to anything else in the boat once you turn the disconnect on then everything is now powered from the disconnect we have two power lines coming out we've got one going to the 60 amp fuse that runs out to our trolling motor wire and this one right here runs into our main fuse panel so from the fuse panel all of these positive wires they're bundled up into here they go to the back side of this panel and they attach to each one of these switches that is what feeds the power from the battery to each one of these switches all of these wires on this negative bus bar go around to the back and they attach to the ground wire that goes to each individual accessory one for the navigation lights one for the anchor lights bilge pump so on and so forth this main lug right here has two ground wires going to it one of the ground wires runs back around and goes to the battery the other one is the ground wire for the trolling motor all right so on the back side of our oodles of noodles we've got those are all the red power wires that were coming from the fuse and they are going to each one of these switches now all of our power wires coming from our accessories so those builds and lights and everything they're coming into this little section right here and each one of those is going into the switch right there all the rest of these ground wires run to each individual circuit inside these duplexes and they're all labeled one goes to the bilge the front navigation lights rear light all the other stuff and all that stuff is right here so i designed this panel to be really easy to take in and out because i didn't know if i was ever going to add anything to this later or have to work on it for some reason later on down the road so i just got some aluminum angle riveted into the front of the boat here and i've also got some down here on the bottom and all i'm going to do is just clip this into place real quick with a couple of spring clamps and i'm going to use some stainless steel self-tapping screws to screw this into place now for the batteries i know this is going to be really hard to see but i'm running two of the everstart marine rv deep cycle 29 size batteries they're group 29 dc is what they call them you get these from walmart they're like 89 bucks they're stupid jeep and they work great i've never had any issues with them before so i've got my wires run underneath this rib and up into the middle so the way i've got these wired is in parallel so that it stays 12 volt but it doubles the amp hours each one of these batteries is 122 amp hours with two of them wired parallel gives me 244 which should be plenty enough for me to run my lights for a night if i want to run up and down the river and you know use my trolling motor for a day without any problems so over here is the positive connections i've got a wire running from one positive to the next positive and then the same thing over here with the ground so i got a ground running from there to this battery right over here now the wires coming in from the bottom that goes out to the fuse panel like i was saying and the positive cable is going over to that battery and the negative from down there is going to this battery that is how you keep it 12 volts and double your amp hours by running two batteries now i've still got to add in another fuse right here and i need to put in the onboard chargers so there you go not super super fancy and i try to keep everything nice and simple there are a million different ways that you can wire these up and there's a bunch of different places you can mount them i just want something simple and easy that's out of the way i don't use the electronics a whole bunch on this boat like you would on a bass boat or whatever pretty much if i go out at night i turn the lights on i leave them on until i'm done with them and then i turn them off purpose of building this boat is not to be pretty it's not a bass boat this is a functional boat this is a boat that i'm gonna bow fish out of catfish out up run on the round on the river do some hunting maybe some duck hunting i don't know i'm gonna do a lot of different stuff with this boat but bass fishing is not the purpose for this boat so i'm not making it look extra fancy like all the fancy little bass boats that you see here on youtube ascended john boats video would not be complete without some time in the haters corner i've got my haterade so here we go and yes my lsu barbecue grill kit was the only bottle opener i had handy don't judge me if you're not familiar with the haters corner what we like to do at the end of every video is stand in the corner and see who was the most butt hurt in the comments section through the last couple of videos and because we know that people on the interwebs are super sensitive we don't use their real names we just call them scooter our first scooter commented over on my float pod video and he writes rough slow and inexpensive wins good ding dong what in the world is it with people calling me ding dong i i don't get it but scooter i sincerely hope that every time from now on when you go to the gas pump you stick your debit card in there and it goes see cashier ding dong our next scooter dropped a comment over on my video about when i welded up my trailer for my 16-foot boat scooter writes did it wrong use another welder oh i love these comments there's nothing that makes me happier than getting on the internet to check youtube comments and seeing that someone telling me i'm doing it wrong and scooter i hope that the next time you go camping that you get in by an angry moose people like that is why i have to put a disclaimer in the beginning of every single one of my videos saying that i'm doing it my way and you don't like it whatever but they still feel the need to comment on something it's not the first time this happened and it certainly won't be the last cause and it will probably happen again on this next comment our next scooter left a comment on my stainless steel prop test video he writes gator tail is a surface drive they don't make long tails it's go devil backwater and they're more expensive bc they're stronger and will last longer coming from someone who's owen both i'd pick american mud motors any day well give me 10 bucks and call me a hooker nailed it gotta love everyone that just wants to tell me i'm wrong about everything and scooter i get why you are so angry but if you wanna fight with somebody don't fight with me start with fighting one of your english teachers from when you were in grade school whoever taught you how to write like that needs to be punched in the nose our next scooter commented over on my boat framing video he writes that's awesome but i would have built it the right way scooter i hope that every time you go to the sink to rinse off a spoon the water hits the spoon and splashes right back on your shirt oh my no no even worse than that scooter i hope that every time you forget your password and it sends you a code to an email so that you can unlock your password that code goes to an email that you can't remember the password for oh our next scooter also commented on the same video and if you guys have watched any of my videos before you know that i like to sometimes say hey guys this is easy it's not rocket surgery well once again i'm wrong scooter wanted to let me know about it scooter writes it is rocket science not surgery well scooter lasagna is basically spaghetti cake and if i want to call it spaghetti cake i can you can call it lasagna our next scooter commented over on the same video scooter writes l i had questions so i typed back are it's just like my mama always says what the hell is wrong with you our next scooter commented over on my led light bar video he writes instructions unclear got pp stuck in ceiling fan you know scooter an erection is not considered personal growth but i have a lot of questions comments like this remind me of a song it goes like every day i'm getting closer taking a bath with a toaster how is that even possible i i could see it getting stuck in a lot of things but a ceiling fan really our honorable mention for this one goes to scooter who wrote on the led light bar he writes i love your content hello from mississippi hell i put a light bar on a minivan scooter if you can't get a light bar to come out of your butt you probably also own a creme brulee flavored dildo cover and glitter but but calm down train wreck this is not your station you put a light on who puts light bars on a minivan i have so many that does sound kind of awesome i'm gonna go buy an astro and put like 25 light bars on the front of it y'all crack me up don't forget about those links down in the description box below if you want to buy any of the stuff that you saw me use in today's video those are affiliate links and they'll give me like 12 cents so that i can go buy some more haterade for the next video and if you want to help support the channel we've got hats and t-shirts link is down in the description box as well before we sign off let us take a moment and always remember money can't buy you happiness but it can buy you a boat bye guys"

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{

"VideoID": "469",

"Title": "Complete Electrical House Wiring / Single Phase Full House Wiring Diagram /- Part 1",

"URL": "https://www.youtube.com/watch?v=srxGewy\_hLU",

"Keyword": "Electrical wiring installation",

"Transcript": "so [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] you"

},

{

"VideoID": "470",

"Title": "Electrical Wiring Installation at Santarli-ATTC",

"URL": "https://www.youtube.com/watch?v=BWlr38LiEks",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] thank you [Music] thank you [Music] thank you [Music] thank you"

},

{

"VideoID": "471",

"Title": "Mini-Split, Ductless AC Unit, Electrical Wiring Codes",

"URL": "https://www.youtube.com/watch?v=NyjtcnrLBNE",

"Keyword": "Electrical wiring installation",

"Transcript": "hey guys Joshua Peterson here with Peterson electric want to talk to you today this video is in pretty much March of 2018 I want to talk today about a mini split it's a ductless air conditioner sometimes they come as a heater / air conditioner we do not install those we just wire for those but in this case there's going to be two condenser fans one in the kitchen and one of the stairs that will be in the hallway off of one unit it's a 30,000 BTU unit states that is 22 amp as far as on the nameplate that'll have the max over current protection device would be 25 amp but if the draw on it is 22 amps so that'll give you an idea of what your minimum wire size will be rated off of keep it in mind just a couple applications I'll go through the code for you but how you're gonna get there and what you're going to do to do that bottom line right here on the side of this panel it can state that at the enclosure is a 10,000 ampere current rating on this for the breakers and it states here to refer you to go to the breaker so we go into this breaker this is a cutler hammer CH version and it states right here your torque specification as well as that it's a 60-degree 275 degrees Celsius rating on that wire but typically you have to go to your lowest setting of a 60-degree it is a 25 amp Max and pasady on this two-pole breaker stab type and we did have to run a twin in here in order to get the AC picked up for it's it's dedicated circuit which is article 210 dot 63 on a 110 plug within 25 foot and GFCI protection because it's outdoor at 2 10.8 so that's going to be coming out of here does not state it has to be 20 amp 15 amp is accessible acceptable for that within 25 foot you could just use that but in this case they wanted an extra one the Union is gonna get wired up next Monday so we just went ahead and wired this up right now today it's in a three quarter EMT conduit with our 10 gauge and our 14 coming in it is going to be fused at a 25 amp FRN fuse FL in our fuse buy little fuse and when we did that as we came in here you have to notice you got your mind verse your load and also we wired in for this outlet right here its a WR wet GFCI rated type TR plug and an induced cover with a bail box that's sealed so anyway so all this came in and terminate separately they'll come in and install this later I want to talk today about why I picked a 10 gauge 10 3 wire on that let's go over here look at the phone and then in fact just to keep the minutes a little bit less I'm going to start a second part of this video so you guys can see the code requirements on it alright"

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{

"VideoID": "472",

"Title": "30 Amp RV Outlet Install - DIY Electrical Receptacle Wiring",

"URL": "https://www.youtube.com/watch?v=yiV8YYgakPo",

"Keyword": "Electrical wiring installation",

"Transcript": "hey there everyone for those of you that don't know me my name is David and my wife and I live in our RV as full-time our viewers and we travel the country and explore everything that America has to offer however sometimes we do come back to our hometown and when we do we stay with my parents here the only outlet that they have available for us to hook our travel trailer up to however is only 15 amp service when our travel trailer requires 30 amp service and not only that but the outlet is nowhere near where we park our travel trailer next to their house at so we have to run a fairly long extension cable to their to the back of their house and into their patio where we can then plug into a 15-amp outlet we unfortunately end up tripping breakers fairly often because you know it gets pretty hot here in Indiana during the spring and the summer so we're trying to run our air conditioning and you know the plug that we hook up into also is on the same breaker as various parts of the inside of their house so we only have 15 amps available to run our trailers air conditioner as well as various electronics throughout their house so today my old man and I are gonna take on a project to install a 30 amp 120 volt RV outlet on the side of their house right next to where we park our travel trailer out and it's going to solve all of our issues with not having enough current available to run our hydro appliances in our travel trailer like our air conditioning so that we no longer trip any breakers when we try to run them in power our travel trailer before we get started though I need to make the disclaimer that I am NOT an electrician and neither is my dad this is just a video showing you how we tackled this project on his home so before you start it yourself you need to consult an actual electrician but let's get started like I said before we're going to be installing this 30 amp RV receptacle on the exterior wall right next to where we parked our travel trailer so it's really close by and we don't have to run any more extent cables and will probably be mounting the box somewhere in this area at least 24 inches off the ground this spot is extremely convenient to mount a new receptacle because as we walk on into the garage and check the opposite side of that wall you'll see that the electrical box is right there so we won't have to make any complex wire runs we'll just drop a wire straight down from the electrical panel right to the receptacle the only parts we had to purchase for this project was a 30 amp 120 volt RV power outlet box six feet of 10 to romex wire a 30 amp single pole breaker and some vinyl j-channel to trim around the electrical box 10 to romex has three wires one with the black insulator for the line one with the white insulator for neutral and a bare copper wire that is the grounding wire 10 to romex is suitable for 30 amp receptacles that have a wire run shorter than 25 feet if your wire run is going to be longer than 25 feet eight to romex is recommended 30 amp service RVs require a hundred and twenty volts not 240 so be sure that the circuit breaker you buy is a single pole 30 amp breaker not double pole and if you plan on doing this project for yourself there's a link in the video description below it to a 30 amp RV power outlet box the first thing you're going to want to do before getting started is look at your home's electrical panel and make sure that you have open spots for a new breaker what made this install even easier for us is that there is this old phone wire enclosure directly below the electrical panel and we tested these wires and found them all to be de-energized and unused so we're going to run the new wire for the receptacle straight down from the electrical panel into this enclosure and then out through the exterior wall and then it was time to remove the vinyl siding from the area that we're going to be mounting the RV electrical box next we measured to locate a stud as well as a horizontal board that is supporting that telephone enclosure we will be screwing into these two boards to mount the RV electrical box we then removed more vinyl siding to get it completely out of our way so that we could properly mount the new receptacle box and if you don't have a siding removal tool I highly suggest that you pick one up otherwise this part is going to be a big pain for you and I'll go ahead and drop a link in the video description below to a siding removal tool unfortunately the electrical box that we used only has knockouts at the bottom and a hole at the top but we need the wire to run through the wall indirectly into the back of the electrical box just for a cleaner install so to fix that we used a hole saw and drilled a hole into the back of the receptacle box we then temporarily mounted the receptacle box to the wall and made sure that it was level with a bubble level we then marked on the wall the location of the hole that we just drilled in the back of the receptacle box and then we drilled that hole through the wall to whenever we do a project we want to make sure that the components we use are gonna last so we then removed the receptacle box from the wall and using a primer spray paint we coated the bare metal on the hole that we just drilled just to make sure that it doesn't rust out over time and while that primer was drying we cut out some flashing that is gonna go behind that receptacle box and drilled a hole in it that the wire is going to run through we then placed this bushing through the hole that we drilled into the receptacle box next we place caulk over the screw holes as well as around the perimeter of the bushing on the back of the receptacle box just so water can't intrude this way then while the caulk was still wet we mounted the receptacle box to the wall being sure to hit the studs that we measured earlier so that it was mounted securely we then trimmed around the bottom of the receptacle box with j-channel by cutting it like this so that the side pieces of jade channel can be bent in under this piece of j.chan 'el so that water can't get in and then we mounted it to the wall using siding nails we then measured and cut the side pieces of jade channel however these ones are made slightly differently than the bottom piece using a speed square we measured off one straight end and one 45-degree end for the side pieces of j.chan 'el so that it can snap into the bottom and top pieces and also look aesthetically pleasing also after that 45-degree cut the rest of the j-channel is sliced and then bent down so that it can bend up under the bottom section of j-channel we then nailed this piece of j.chan 'el to the wall as well and made a mirror image of it to trim the other side of the receptacle box all that was left for the trim then was the top piece it's very similar to the side pieces however both ends are cut at 45-degree angles and both ends are bent down to fold over the side pieces of j.chan 'el we nailed this to the wall as well and then trimming around the receptacle box was finished this part of the job wasn't really necessary because I suppose we could have just ran screws straight through the receptacle box through the vinyl siding and into the wall to mount it however this just looks so much nicer and ensures that it is weatherproof and once that trim was finished we just had to cut out some sections of the existing vinyl siding to make room for that receptacle box all that was left before we actually got into wiring the receptacle was to replace the vinyl siding here's how it looks when you use the j-channel trim the way we did I think it looks pretty sweet and the extra time it took to do this was well worth it in my opinion now we can begin wiring in the receptacle but before we do anything you'll want to shut off the main breaker which will kill power to your entire house as well as your entire electrical panel except the main cables that run into the electrical panel these are still energized so be very careful when working near them here's the electrical panel we're working with this house was built in the 1960s and since then there have been a lot of changes to its electrical system so unfortunately the electrical panel is not very well organized this panel has five open slots and we'll be utilizing one of them with our 30 amp single pole breaker to supply power to our new receptacle one thing to know about this electrical panel that's probably different from yours if you have a newer house is that the neutral and grounding buses are one in the same on your electrical panel though they're probably separate buses on the main electrical panel this serves the same purpose however since the 1960's wiring standards have changed power may be cut to the house but thankfully our RV has an inverter which will supply 120 volt AC electricity to two outside receptacles we'll be using that to power our work light as well as a 90 degree drill that we use to drill a hole through that telephone enclosure and then using a hammer and a punch we knocked out one of the bottom knockouts on the electrical panel we then ran ten to romex through that knockout down into that telephone enclosure and then straight out to the new receptacle box next I strip back the outer sheath on the romex cable snap the new 30 amp single pole breaker into an open slot bend the black line wire right into position in front of that new breaker cut the wire to the proper length and then stripped it back fed the wire into the breaker and then tightened it down then I moved on to the neutral wire I bent the white neutral wire into place just in front of an open slot in the neutral and grounding bus cut it to length stripped it back and then place it into the open port and tighten down the screw and then I moved on to the bare grounding wire which the procedure for this is the exact same as the white neutral wire I bent it into place in front of another open port in the neutral and grounding bus cut it to length and then place it into the open port and tighten the screw down it's important to note that in your neutral and grounding busses you never want to double up wire each individual wire should have its own port and screw in these buses we're now finished inside of the electrical panel so we can put the door back on we're now ready to wire in the receptacle so I strip back the outer sheathing on the romex cable strip back the black line wire as well as the white neutral wire here's the wiring diagram that came with this receptacle box it shows that the black line wire gets wired into the left port the white neutral wire gets wired into the right port and the bare grounding wire gets attached to a case grounding bus which comes already attached to the receptacle box a green grounding wire is already attached to the other side of this bus as well as the grounding port on the receptacle so I place the black line wire into the left port the white neutral wire into the right port and the bare grounding wire into that case ground bus I ensured that the wire screws were all tight and then replaced the receptacle into the box I then replaced the screw that mounts the receptacle to the receptacle box and now all that's left is to test the receptacle so we can go back to the electrical panel and flip on the 30 amp single pull breaker that we just installed and now we're ready to flip on the main breaker as well it's usually a good idea to double check everything just to make sure you're not gonna have any problems when you re-energized your entire electrical panel now before we just go and plug our RV into this new receptacle we're gonna want to test it with a multimeter to make sure our voltage is correct with the multimeter set to readout volts AC and the positive probe placed in the line port and the negative probe placed in the neutral port you should see a voltage readout around 120 volts now with the positive probe placed in the line port and the negative probe placed in the grounding port we should still see about a hundred and twenty volts and then with the positive probe placed in the neutral port and the negative probe placed in the grounding port you should see a voltage readout of zero volts now before plugging the RV into the receptacle we're gonna do one last sanity check and that is plugging in our RV surge protector into the receptacle this RV surge protector has LED readouts that will let you know if there are any issues with the receptacle you're plugging it into such as open neutral open ground reverse polarity or no power now the test that we just did with the multimeter would tell us if there are any of these issues like I said this is just an extra sanity check on a side note it's always a good idea to use an RV surge protector when you're plugging in your RV to any receptacle it only takes one large surge to burn up your entire RV electrical system if you don't have one I'll go ahead and drop a link in the video description below to this one we have we love it now we can plug the RV in and see if everything works here's the fridge working off of AC power as well as our air conditioner success then we tidied up by replacing the cover on the telephone wire enclosure and created a much cleaner and more obvious identification system as to what circuit breaker provides power to what part of the house and then the final step of this project was to crack open a couple cold ones and celebrate a job well done and that's it the project is finished we will now never have to worry about tripping breakers with our travel trailer when we are firing up our hydraulic liance is like our air conditioner and our water heater when we are visiting my parents here and that's great because we felt bad every time we would trip a breaker because it would knock out the electrical service to about 1/4 of their house but now we don't have to worry about that and it's a bonus for my parents too because up and til this point they did not have an electrical outlet here on this side of their house and now with a simple 30 amp 220 amp or 15 amp adapter they now have electrical service available for whatever purpose they may need it for the total cost of this project was only about $60 and you can knock it out in about an afternoon hopefully this video is helpful if you're looking to take on a project like this for yourself but that's all for this video I'll catch you guys later bye [Music] [Music]"

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"VideoID": "473",

"Title": "Electrical Installation Lesson13 Domestic House Electrical Wiring",

"URL": "https://www.youtube.com/watch?v=5KezCTg0JMk",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] [Music] he he [Music] hello viewer and welcome to artist three my name is Danielo from West Technical Training Institute uh and I'm here to take on electrical installation uh last week or last time we discussed about uh installation and we discussed about the typ types of installation that are possible in a domestic installation and today we are going to see how uh the wiring should be done and we are going to first of all discuss about the wiring systems uh that are possible in a domestic installation uh in a domestic installation uh we have allow we have two uh types of wiring system that are admissible in domestic installation and one of them is uh what we refer to as uh service wiring service wiring number one number two we have uh PVC uh PVC Cate uh uh wiring system uh we said that uh in an installation the installation needs to be protected uh one against over current that would destroy the cables and two uh against mechanical damage so uh that's the reason why we have uh these types of wiring system and more so uh to protect against mechanical damage of the uh of the installation uh one of the methods that we use to protect against mechanical damage is the use of [Music] a a she and this chip is made of PVC is made of PVC and then uh the cables lay uh lay enclosed in a sheath and to looks like this it looks like this uh as you can see uh these are the uh the cables and uh this is the conductor this is the insulation and this is the sheath that we are referring so the purpose of this sheath is to protect uh against mechanical damage and also against uh any other damage be it chemical that would attack the cables because we said that uh the cable or the wire consist of three parts uh we have the one that is you can see here uh this is the conductor and the conductor uh is made of copper so uh a cable uh consist of one conductor uh number one number two uh it is the insulation and number three the mechanical mechanical uh protection now uh the what is very very important or what is the most of concern to us is the conductor plus the insulation and we must protect uh the uh the insulation plus the uh plus the conductor if we don't uh protect the insulation what would happen is that the isulation May Fail and if it fails then we would have a a short circuit So to avoid that uh that's why we have to protect both the conductor and the insulation so that they always able to perform the work that they supposed to be to be performing now uh when we add the mechanical protection uh this protection made of PVC sheath uh protects both the conductor and uh the insulation and in some degree to some degree uh it offers some mechanical protection but the mechanical protection offered here of course might not be very might not be very much but it can with some mechanical stress that would otherwise eure the insulation and of course now daging the cable uh that's why we refer to this as a she cable and this sh cable is used for service wiring and in service wiring it means that the cable lies flat on the service the cable is flat on the service and there is no other protection that of course would be provided but uh in domestic setup it might be it might be good because uh we don't expect uh so much to uh destroy the uh the conductor and that's what we have for service wiring then uh the other system that is uh used in domestic installation is the use of a PVC Cod now uh the PVC Cod uh offers a better mechanical protection and uh it is um it looks the presentation of the installation looks better uh CWI is a cylindrical pipe whereby wires run through and uh uh they they are protected by the Cod the CWI looks something like this the C looks something like this can see uh this is a uh a quadrate made of PVC can see the the in it is circular and it has a diameter uh the diameter that we normally have for domestic installation uh we use both uh 20 mm and uh 25 mm 25 mm so uh this is the uh this is the inside diameter of the pipe and we can have cables ring through and of course when cables are landing through here uh they have a very strong um protection and of course uh they are protected both from mechanical damage and any chemical uh attack that would otherwise work on the insulation so and th d the insulation and uh the PVC Cod uh is quite strong it's quite strong and it produces some uh very nice work it produces some very nice work uh plus uh it has uh other advantages uh that of course uh provides a better mechanical protection than the sheep and also uh it allows uh the it allows uh more to learn through because when you compare this with the with the wiring that we have here now if you have a number of uh conductors that you want to Lear along with this then it means that you have to use another she cable and another she cable and another she cable but when you have a PVC Cod then it means that you can draw uh a number of cables here uh to the maximum allow uh number so that you accomplish what you want to accomplish with the Cod so that's what we have uh for these uh two types of wiring but uh though though uh we are saying that uh we have this these are not these are not these are not the only uh wiring systems that could be there because uh when you go to commercial I setup and Industrial setup the other wiring systems that could be in addition with that so uh that's what would uh uh uh that's what we'll be looking in details uh to see how it is actually done so for today we have been able to see that uh uh the wiring systems that are typically use for domestic installation are two that is we have service wiring where we use the sheath and we also have the PVC Cod uh for now uh we have seen that uh for domestic installation we do uh service wiring and PVC uh CAD uh and in the next session we are going to see uh other types of wiring systems that are used in both commercial and Industrial [Music] setup [Music] he [Music] [Music] he [Music]"

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"VideoID": "474",

"Title": "Outdoor Electrical Wiring and Landscape Lighting",

"URL": "https://www.youtube.com/watch?v=GixfggjsqCY",

"Keyword": "Electrical wiring installation",

"Transcript": "well hello again do-it-yourselfers welcome to electrical dash online.com home of your internet electrician and that's me terry peterman and of course you're watching me right here on youtube so in this project video i'm tackling a backyard landscape lighting project as well as getting some power outlets out in the backyard just so we can have uh somewhere to charge your phone while you're out by the fire and possibly later down the road if somebody wants to go to low voltage landscape lighting there they could plug in the transformer for landscape lighting however in this one i'm going to go with 120 volt landscape lighting now the reason i chose to go with 120 volt lighting instead of the traditional 12 volt or 24 volt low voltage system number one the thing about landscape lighting in the low voltage form is that anybody can do it you are working with low voltage so you don't have to bury your wires too far underground and they're fairly easy to work with and solar of course that's another whole ball game where you've got to worry about batteries wearing out usually annually bulbs becoming loose and and corroded so you have to fix up the connections all the time on both low voltage and solar lighting so i wanted just to go back to good old 120 volt lighting so i'm going to bury this in half inch pvc conduit and i'm going to run it throughout the yard i'm going to make a loop through the yard um while i'm there i'm picking up power to my greenhouse that we just recently installed so i'm going to show you all that how i've functioned or how i've made that all work and i'm going to draw you a little map and show you exactly kind of what we're going to do with the backyard but without further ado let's get at what i'm doing here so here's a little sketch i drew on the whiteboard of what we're going to be doing just roughly we gotta not to scale of course or not expertly drawn patio here we've got our greenhouse here this is a little weatherproof panel outside that we're going to feed this from coming down into the ground with half inch pvc up here is going to be the switch for the landscape lighting out of the back of that box into the greenhouse to feed it that's going to be a separate video as to how i do the wiring in that greenhouse very basic but something good to see back down underground we've got to go around a planter here that i forgot to draw in so we've got a 90 a 90 and a 90 up to our first pedestal that's where right it's right by the fireplace area fire pit area so that's going to be where you can have a 120 volt gfi outlet here and some landscape lighting to light up the area and then we're going to move on catch another pedestal here with just landscape lighting on it another pedestal here and these are going to have spotlights i'm using led spots so they're just going to shine in both directions here i'll just draw that in they're going to shine that way in that way and all these fairly low to the ground i'm only gonna use 20 inch posts here so another one here with a flood light that way in that way and then over to the final pedestal which is just lighting up a little japanese maple in a little flower garden here so that one will shine that way and that way so that gives you a rough idea what we're doing i'm going to show you how i'm building these little posts and pedestals with that that will house the power outlet the receptacle and the octagon or the round pvc box to put on a fixture okay so what i'm going gonna do is i i'll show you those later but i've got some spikes four by four anchor posts that you pound into the ground they have a long about a 24 inch spike on them and a clamp at the bottom that'll hold this four by four so that's the basis for my pedestals a four by four post it's about 20 inches high i'm going to put a nice little cedar cap on it like that and at the top i'm going to have my our round octagon box not octagon it's round pvc box which will be the fixture the outlet box for just a simple two spot flood light housing or a spotlight housing with just regular lamp holders here outdoor suited for outdoor use of course and i've got dimmable led floodlights i for some reason had a bunch of these left over so i thought why not use them up so these are going to be mounted on the round pvc box you can adjust them to shine out what i didn't show you on that drawing is those eight boxes along the back are actually flower gardens tiered all the way up to follow our sloped backyard here follow the cedar fence line so two of those spa separated out will be enough to light up i hope that whole flower garden back there there's just a tree and a couple shrubs on either side in each one of those so with these flood lights lighting that up nice and low should look good and then out of this round pvc box of course i'm coming down at the first one i'm coming into a receptacle box which will have a gfci receptacle as i said by the fire pit area and the other three posts are just going to have this uh 4x4 junction box below the round box and that way i can come up with my half inch pvc i can come up out of the ground with the 90 in and back out to the next pedestal location and i'm even leaving one of these at the last one of the run gonna come into one side so that if there's anything else i want to add later on i can come out of it with another chunk of half inch pvc it's going to be one circuit does all this low low wattage led light bulbs so they're going to be eight or nine watts each so eight of those uh eight times nine is 72 watts for the entire system so that's how we're gonna do it i will take you outside now and show you exactly what we're doing and we'll get at the project so let's go outside all right so as described in the opening there's my source back there is that outdoor panel going down underground and coming across between the patio and the greenhouse is my half inch conduit it comes up on one side here of this fs box with two inlets at the bottom and then back down it's going to go around the yard to my yard lights and my power point there over by the fireplace so i'll show you what i did inside the greenhouse but this here is going to be the dimmer switch for all the yard lighting which is going to be 120 volt as i described then i came out of the back of this box and into the greenhouse where i'm going to put a switch probably switch outlet combo because all we'll ever need maybe in there is a space heater if we keep things in early or late into the season and you want to keep them in the greenhouse and warm things up at night and then a switch for a light should we need a light in there so that i'll be doing later on in the project that'll be a whole other project when i wire this greenhouse but for now pipes just going inside to a box that i'll show you in there and then like i say back down 90 degree underneath this little sidewalk i have built here and now i'm gonna have to dig my trenches to all my locations for lights which will be four locations and i'll show you those throughout the yard here all right now from inside the greenhouse here you see that outlet box it's a pvc box where you just drill your outlets that you need into it so i'm coming into the back of that one with my power i'll put a switch receptacle combo here and then i'll come out of the top of that and we'll go up to a led strip light in here for some lighting now as you can see how i mounted this this is just a rather uh lightweight greenhouse but it's got these tracks on here and you slip nuts into these tracks there has to be an access hole where you drill in and can get a nut head back inside here or i should say a bolt head and then i fastened some unistrut here so this is 2h unistrut and so this is good and solid screwed by box good and solid here and then out of the top like i say and i've brought another piece of unistrut across here that i'll be able to strap probably i'll either get some liquid tight or should say emt with liquid tight fittings i'll use so i can bend that bend here or i may even just use some liquid tight flex out of the top of this and bring it up strap it on that unistrut and then i'll mount a fluorescent led strip across those struts in the peak so there again is my source panel little four circuit panel there outdoor rated and i've got my conduit going down for another application but then the half inch conduit that you see running along here it'll be all filled in i've got to put a lot of fill in here between the house and the i should say the patio and the greenhouse so that'll be all covered up to the proper depth then i put a 2x4 in here to mount this switch on dimmer switch i'll use for the outdoor lighting and my got my power coming in then from the panel and then going back down underground which again this will all be filled in underneath that little sidewalk and out the other side so there's the conduit coming out from under the sidewalk i taped up that end so nothing would get into it i put this in before i built that little sidewalk and as you can see i don't have my grade up to level here yet that's coming so i really don't have to dig very deep because i'll be bringing in a lot of fill here at least another foot to fill along this side so my conduit will carry on here i'll make a 90 degree bend through here between these two planters another 90 degree bend we're going to come up that post it's going to be a 4x4 post with my light fixture on it and this one is also going to have a power point here just a receptacle so we can charge the phone if we're sitting out here by the fire so that'll be one light give you some light if you need it to fill wood in there and build your build your fire starter your log cabin or your tp whatever you want to do give you some light on that and some light around ambience landscape lighting around the patio area fireplace area so then i'll go up that post back down i'm going to catch this post which is going to be just two spotlights flood lights to light up the garden area both ways here and then i'll be digging over to another location there evenly spaced along the back garden here that planters and then the last step will be up into that post back down and over to this one to light up the japanese maple here and this little flower garden so showing you where everything is now i got to get to work and start digging and as i said i don't have to go too deep because i'll be adding a bunch of fill on here but i want to give myself lots of room to work approaching where i'm going to make my 90 degree bend so we'll come straight out of here 90 degree bend and another 90 degree bend and another 90 so that run is going to have 490s which is the maximum allowed all right so i got the first run of conduit done see i added on with a coupling there from where it was coming out from under the sidewalk turning the corner and heading over this way to the first post so i just need to run a 90 up there and then a 90 back down into the ground and before i do that and cut my pipe to length i'm going to bury this and tamp it in so that my pipe doesn't move because if i cut that to the right length and the 90's not coming up exactly where i want it then i'm in trouble and i'm going to have to move the pipe somehow so to avoid that i'm going to make sure i put the dirt back in in the trench tamp it all in and then i'll know exactly where that conduit is when i cut that 90 going up and i'll show you that a couple tools i've used so far is tape measure pencil sawzall and this isn't essential but it sure helps nice cold beer okay so i've finished stubbing up to my first post first pedestal here by the fireplace now i strapped on temporarily there i strapped that conduit onto the post anchor here so that to hold it in place and then i taped the other one in because it's just a little bit too low to get a screw in so i just taped them together to keep them the right distance apart because both of them are going to be coming in to this box i'm going to have to drill my holes half inch knockout holes to uh bring in the conduits into this junction box when it's mounted on the pole on the post i should say not the pull and so you want them evenly spaced in the in the right position before you of course backfill your conduit here so find any method possible to tape them in the right spot or hold them in the right spot before you backfill so as you see now i'm coming from the house or from the panel the source here i've got it back filled to there and now i'm off to the second location over by the flower beds where the lighting will be and that's coming up the back side of that post and i screwed that to the to the frame of the post anchor as well just temporarily like i said because i won't be able to put that two by four or four by four in there with the screw in there so i have to have that just temporarily held in place just to hold things together while you backfill and while i'm talking about it these posts you want to make sure before you start a project like this that you have no services in the backyard and i don't i know that for a fact my water's in the front sewers in the front and my all my electrical and and communication cables are overhead so i had nothing to worry about back here gas line also out front but if you do have any any uh utilities underground in your backyard or anywhere for that matter you got a call if you have a system in place for a first call you need to make that call so they can locate any utilities now i had mine all located when we started this project so i know that there's nothing back here i felt safe to go ahead but you could imagine pounding in and i showed you that this post anchor before pound that in and it goes in like two feet you could easily pierce a gas line gas utility line or an electrical cable or anything so always do first call before you dig do any digging projects in your yard okay so you can see here where i've just put one screw into a strap just to hold that conduit in place and off it can coming from the first pedestal by the fireplace and then we're gonna head in this direction to the next location up the hill here and to make this little conduit run work here that's gonna go into this junction box and then out i uh gonna have to bring this one in below that one so it fits nice and tight against the post and it'll head that way towards the next location so i'm gonna tape this into place or put a strap on and screw it and finish digging my trench over to the next location so back to the digging okay so digging off to the third location here and i might as well just give you a couple tips on digging a trench i had to learn this the hard way my first job in the oil field for doing electrical work i spent the whole summer on the end of one of these a goon spoon so when you're digging dig away from your trench stay behind it and always pry into your ditch that you've already dug so it's much easier to get the soil out so just take little bites go one way on that ditch i'm almost to where i want to be here and then you just turn around dig back the other way doing the same thing digging into the hole you've already dug prying into that hole and then at the end you just come along and scoop out the loose soil and you've got your ditch ditch digging 101. okay so i've done my last stretch of trench here from the third location to the fourth here so i'm gonna leave no backfill around my post so i can adjust my conduits when i go to finish up putting them up the four by four post so i'm just going to show you there's a little tip to back filling a trench as well you always want to kind of rake it with your edgier shovel the side of your shovel starting by just raking off the top so that what you took out last goes in first and you just kind of go along like that knocking in the debris material you took out last first and then when you get to the bottom you're taking out what came out first back on top again so you see using the edge of your shovel or the side of your shovel like that you can clean it up pretty nice and then you leave a little mound over top of your trench you can stomp down after and compact now kind of a funny little story here that sandy might get a kick out of when she goes to edit this when i pounded in this last anchor for the post that last spike that was the first one i actually pounded in and i kept hitting rocks everywhere i moved it i wanted it right in front of this flower bed right in center i kept moving it back and forth and about six inches down i'd be hitting something solid turned out it was this guy this giant rock here so i ended up having to dig down here and dig out that big rock and so that was that enabled me to pound this post down in or the spike into the ground and then uh i wanted to fill it back in but of course i'm missing that much material because that was rock we'll use that somewhere in the yard for landscaping so i went and gathered up a bunch of broken concrete and ugly rocks to fill in the hole and i filled it all in and i took the sledgehammer and pounded those rocks all back in made it nice and level and then sandy's watching me and says don't you uh need to leave that open to dig your trenches and get the conduits in so i i had no recourse but just to start digging back the rocks out so she she had to point out a few things to be there to make sure i kept on track thanks sandy okay i've got all my pedestals mounted now i'm going to show you a little detail when i get up close as to how i uh put those in place but i've got all my wires pulled now it's been a crazy weather day here she maintains british columbia we've gone from warm sunshine to rain drizzle hail and then even sunshine while it's hailing so anyway that's uh neither here nor there but it's made for a challenge in getting this done between showers so i've got the first run is to that that uh pedestal right there by the fire pit that's gonna be the receptacle and the landscape lighting and then we're looking over there at the other one by the flower beds looking at the back side of it got the wires pulled in all the way over to that pedestal that's going to shine on the flower beds as well and we got this last run of wire to pull in so i'm going to show you how we do that using a fish tape and hooking our wires on and pulling them in so first let's start with sorry for the shaky camera angle there first we'll start with pushing that fish tape from that junction box at that third pedestal and we will bring the fish tape up here at this pedestal and then hook the wires on and pull them back all right so i just got a uncoil some of my fish tape here it's kind of wet out here so i don't want to get my fish tape wet and if i do i want to dry it off because nothing worse than our rusty fish tape makes more friction harder to push in and shortens the life of your fish tape so should be an easy one only two nineties to go through the one with 490s didn't go too bad at all there i could feel them at the second 90 and i'm in the junction box all right fish tape is here bring it out i'll hook my cables onto it or my wires i should say all right so i'm going to show you the proper way to hook these wires to this fish tape just talking about the wires for a minute here i could not find single conductors at the home improvement store and i don't have an account yet here with a wholesaler but you would have the same issues if you were trying to do this job as well so i just recommend picking up some lumx or romex and stripping that outer jacket and using that cable so that's what i've done i just bought the roll of 14 to lumex we call it here in canada or romex in the u.s and i stripped it stripped the outside jacket to pull it into the conduit as per code so i also was able then to use a black wire for an extra conductor and a white wire in some cases as i did here for the extra conductor and i just identified it as red and i'm going to do that even with the extra black wire the reason for that is i'll explain when we're hooking up the the switch for everything here but i've got one receptacle here and i want to be able to add full power at any of these pedestals if i ever need it so i'm going to have three conductors one neutral two hots and of course a ground the one hot which will be the one identified red whether it's a black or a white wire that i've used here just to not waste anything because the price of copper these days and wires sky high about three times what it was when i was back contracting anyhow the red wire will be the wire that's hooked up to the dimmer switch for all the landscape lighting and then the black wire is going to be the one that's going to run anything that's going to need power all the time like my receptacle by the foul by the fireplace so just a little explanation on that let's hook these wires now onto my fish tape now with a little short run like this you could almost just tape the wires to the fish tape and it would pull in fine but the worst thing that can happen is when you get almost your cables all the way in and then they pull off the fish tape and you got to start all over so i'm just going to show you the best way to hook wires individual conductors to a fish tape that way you know you won't lose any and they'll all come in together so basically a strip about two three or four inches off each conductor like i said overkill for this short run i could almost push him in from here so strip a little chunk of insulation from all the conductors and of course we have our bare ground wire and if you were using individually individual conductors you would buy likely a jacketed wire for your ground and it would be green i don't know if you can hear the quail calling for his mate lots of wildlife in the yard here okay so with all four conductors stripped what you want to do is wrap two of them one way through the fish tape poop and two the other direction and if you were doing a big long pull like we used to do in the oil field through heavy duty rigid steel conduit we would then twist them together so they can't come apart but if you just pinch them nice and tight on your fish tape like this and then tape critical use your electrician's tape tape these together nice and tight make sure you get over top of any ends that are sticking out the thing is you don't want anything that's going to catch on a conduit coupling inside that pipe and cause you to have to pull it out and start over you also want to tape up your hook on your fish tape to make sure it doesn't catch on anything but if you've bent a proper hook on your fish tape which i'm going to show you in a video one day then you don't have to worry about that catching either but tape them all up give your tape a twist at the end here just so you can grab that end when you're done and there you go you want to run your hand over it make sure there's nothing snagging or catching and we can go ahead and pull these conductors in now it's good to have somebody on the other end pulling while you feed but again this is such a short run that i'm going to be able to just poke those down the pipe if you had a big run and you had a lot of conductors close to your fill factor or the the allowable amount in a half inch you'd want to maybe lube these conductors up there's stuff called wire lube water soluble wire lube and around the house something called dish soap works just as well or and especially maybe dawn because that's of course environmentally friendly you can clean ducts with that so now we'll just pull these in and we'll go on to hooking everything up okay and there we're in pull enough to get up to the light outlet all right so after i assembled the the uh octagon of the round pvc box to the junction box in the case of the other three and to this receptacle box in this case what i did then is i set the post down on the on the spike mount and i measured the distance of conduit i'm going to need from the conduit that's coming out of the ground here into a coupling and then into the connectors on the bottom of the box so i might took that measurement pulled the post back off went and cut my my uh pieces of conduit that fit in here they were between three and four inches most of them then i cut them glued them into the connectors that are underneath the box here that you can't see and then i glued the couplings down onto the conduits coming out of the ground and then the final step was was put the cement on the conduits slide the pole down in and the conduits down into the couplings and push it down and done so that finished off those nicely all right so i'm ready to hook up this pedestal this will be the last in the run so i'll just show you how i'm doing this on the last one here the other ones are going to be a little hard to get the camera in behind because they of course are pointing towards the fence and the flower beds so this is the best one to show you so here's my conduit coming in to this 4x4 junction box kept it on the right side now i could go out on this side of the box if i ever need to carry on with some other landscape lighting or powerpoint somewhere throughout the backyard so the only difference with this one and the other junction boxes that have ins and outs is that i will have to splice my neutrals and my blacks together in this box tuck them away for future use because again that black wire will be full 120 volt and then the red wire that i've ran is from the dimmer switch so the red wire is going to be used throughout for the landscape lighting so i just have to hook my fixture up to the ground the white and the red up here in the light outlet box and here these will just get tucked into the box and put the cover on so let's do that and you want to just i capped off the black here with the moret like i said it's not going to be used if we ever do use it we'll just splice that white wire and splice in three whites and because we'll have one carrying on and we'll tie on to that black if we're needing the full power for a receptacle and we will also be able to tie into the red if we want to continue some landscape lighting somewhere so tuck these in nicely out of the way i'll put the cover on that when we're done i've got lots extra wire here probably shouldn't have wasted any copper with the price of cable and wire these days but really a minor detail in the big picture here now ground wire is going to have to get tied on to these metal lamp holders as you can see they have a ground screw in here so i'm going to have to wrap that ground wire around one 180 degrees and then over to the other one and i'll leave a pigtail just in case you ever need to tie a ground on for a different kind of a fixture i won't snip any of that off so and get it ready to connect okay so first things first i will connect that ground wire make sure your gasket's in place before you do your wiring or you're gonna have to undo it to get the gasket in place and like i said i'll hook around one screw 180 degrees should be coming in at this angle just because there's a ridge there to retain the cable the wire i should say so i want it going towards the inside of that housing i don't know if you can see that you'll see it better on the second one i do snug that down and then you'll see it better on this one wrap it around that screw gotta loosen that a little bit get the copper wire in behind it and bend it so it's nice and tight around the screw grounding or earthing screw you can see that okay so both of my lamp holders are grounded we'll leave that tail let's tuck it into the box and now i'll connect my neutrals so we got two pigtails coming out of each lamp holder one of each out of each i should say for total two twist those stranded wires together and connect that to the neutral source tighten that wire nut down pull hard on each stranded conductor and the solid make sure they're in that splice good and solid and now connect to the red both blocks make sure their ends are even twist those together bring in your solid source hot wire tighten that down good and tight and again check make sure that both they're both firmly inside the wire nut tuck your excess back make sure there's ground wire it wouldn't be even a bad idea to put a marette on it here because if when you're pushing it back in the box technically you could end up shoving that bare wire up into the wire nut for a dead short circuit but unlikely but hey i always want to try to teach you the best possible practices here all right ready to put the screws in get it started first make sure your gasket is good all the way around okay there's my fixture on i can adjust these lights however i want but you can see the gasket is nice and sealed all the way around for a watertight seal so now we just got to put on the 4x4 cover with gasket start all your screws before tightening down check your gasket it's compressed all around there you go all i got to do is put on my lamps and make some adjustments the way i want these lights to shine all right so i've worked my way back hooking up all the pedestals now to the first pedestal that's downstream of course the supply and the switch for it i'm going to explain these connections inside this gfi outlet i'm putting by the fireplace as you can see here i'm going to tell you the red wires are just spliced through so coming in from the dimmer switch going out to the next pedestal and then going up to the light fixture above this one that's why you see three red wires there spliced together they're going to be tucked into the back of the box dealing with the ground wires which i usually like to talk about first but let's go back i've got the ground wire coming in it's tied off to that metal bracket inside that pvc box that you see on the upper left there's a ground terminal for that then they're pigtailed so ground wire in ground wire going out to the rest of the circuit and a ground wire going up to the light fixture with the pigtail now to go to the switch so or to the gfi receptacle so we've got four 14 gauge wires inside that gray uh ideal moret ideal wire nut that you see on the right sticking out with the ground wires three in so ground in ground out ground up to the fixture and a pigtail for the gfi then dealing with their neutrals same thing as the grounds we have neutral in neutral out neutral up to the light box and a pigtail to go to the gfi receptacle and then the hot wires that are not through the switch or the dimmer switch the constant hot for the receptacles i've got power in power out to the next pedestal and a pigtail again so we got three wires here in out and a pigtail to the gfi now i don't have any other receptacles downstream of this but in future i may and one would think well then why don't you use that gfi receptacle and protect the rest of the future outlets on the load side of it well you can't do that here because the way it's wired we have one circuit a 15 amp circuit feeding this and if i was to wire up that gfi receptacle with the load terminals or the line terminals in on the inside of the gfi receptacle and then the load from here on going out to the rest of this circuit well if you turned on a light switch or yes you turn on the light switch and the lights are working suddenly you'd have current flow coming back through that gfi receptacle on the neutral because it's the same neutral so any time you turned on the landscape lighting all that current would flow through the ground fault device which basically monitors the current on the hot and the neutral so you'd see now three or four amps coming back through this gfi but nothing going out because there's nothing plugged into this outlet and it would trip you'd have nuisance tripping instantaneously instantaneously so what this means is that if i ever do add a receptacle anywhere else in the yard using that black and white i'm going to have to install another gfi receptacle at that outlet and hook it up to the line side terminals so just kind of something to be aware of if you did try to hook this up like a regular in and out with the line and load of a gfi you would have tripping just because of that neutral current that you'd see coming back through it on the neutral wires from the lights and just backing that out you can see how i've got the red the white and the ground coming up for to hook up this last light fixture so others may ask as well do you need gfi on the lighting as well on this circuit the answer there is no it really wouldn't be a bad idea because there is some potential to come in contact i guess if you stick your finger in the socket but with outdoor lighting if it's going to be plugged in then yes you have to have a gfi outlet outside to plug that lighting in because you have access and could come into contact with the live wires by touching the prongs or else or elsewise but being these are actual light fixtures on a switch then you do not need gfi protection for that because you just need to ensure that your equipment is all rated for wet location and that is we have gasketed fixtures and fittings and uh there's no way for water to get in there and you really aren't getting at the you're not accessing the power there they're just hooked up to the fixtures the light bulbs are installed and the led lamps so no you do not need the the gfi protection on the lighting portion of this however like i said it wouldn't be a bad idea and if i was to do it that way then i would just feed this whole circuit with the gfci breaker then the entire circuit would be protected but the risk is minimal and the code does not require the lighting to be gfi as i mentioned unless it's plug-in fixtures okay so i've got my gfi outlet all installed with along with the in-use heavy-duty receptacle cover so there it is inside there now before you get all excited and say and fill my comment section with hate i i've linked a video that i did before on the exact way to install these in-use covers it's on an outdoor wall but it's exactly the same box in use cover so you can check that out like i said the link is in the description so go to that if you want to learn how to install these properly but there you go now working our way back we're going to the switch the dimmer switch and our power feed points all right so working backwards we're at the final destination which is actually the start to the circuit other than the panel which we'll get to and hook up that breaker but this is where we put in the slide dimmer switch so explaining what we have going on here we have our power conduit coming in from the panel going out to all the pedestals and going out of the back of the box into the greenhouse and as i mentioned that's another video we'll do on wiring up that greenhouse it'll be a short one this is a fairly extensive little project we're doing here now so the splices explained once again ground wires all ground in ground out ground over to the greenhouse and tied in the ground wire that goes to the dimmer switch the neutrals neutral in neutral out neutral into the greenhouse the hot wire in from the panel out to the rest of the circuit for receptacles and out to the greenhouse so in out and out so three wires in that splice and then i tied in the wire for the dimmer switch the feed wire and now on the other side of the dimmer switch the red wire this could be a three-way dimmer so it's an optional three-way this this one stays on because we're only using it as a single pole application so the red wire from the dimmer switch goes to the red wire to feed all the landscape lighting so again if you're wondering if you'd like more detail on making splices multiple wires and a splice and such and you feel i missed that you'd like more more information on that we're linking in the description a video that is a five part series on wiring a switch from start to finish so i go through the whole roughing of a a box in a residential application but i show you all the ground connections all the neutrals all the hots how you pigtail how you make those splices by pre-twisting some others know total detail there so click on that link if you want to see how to proper wiring methods for for all those multiple splices like that so just to recap grounds neutrals in and out and out again to the greenhouse hots in out and out to the greenhouse and to the dimmer switch ground to the dimmer switch as well and then out of the dimmer switch to the red wire that's going to do all the landscape lighting so we'll put this all together this one is just outside of the awning cover for the patio so it will be exposed to moisture so we're going to put in put on a outlet uh weatherproof outlet cover for a gfi it's a decora decorator so it can be a decora switch cover plate or a gfi or a regular decor receptacle cover plate that'll go on top of this so you'll just have to lift the lid on it to adjust and turn on our landscape lighting okay so i've hooked up the wire into the panel i couldn't really get the camera in there it's in a bit of an odd position because i have to be standing between the patio and the greenhouse so there was no room to get the camera in and show you that but in there the wire just comes in you got your ground connected to the ground lugs neutral to the neutral bar and the hot wire to the breaker you see there on the left so let's turn that on and check things out well thanks for watching that project video landscape lighting in my backyard along with that receptacle that we added it's not maybe for everybody those two lamp holders and dual flood lamps at each pedestal as i did but i like it and as i said in the opening i had hardwired low voltage landscape lighting in my yard in arizona and seemed like i was constantly picking up those wires with our rake because we just had desert landscaping there with with washed rock and kept hooking those cables so that can be a curse as well and one day i had the bright idea to bury all those cables few inches under the ground and with all my digging in the backyard i ended up putting about four holes in my irrigation system so to try to solve one problem i created many more so again thanks for watching i'm terry peterman your internet electrician do not forget to like and subscribe to my channel and click that notification bell so you'll know when i release a new video thanks again till next time you"

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{

"VideoID": "475",

"Title": "Rough In Electrical Wiring on a SIP home.",

"URL": "https://www.youtube.com/watch?v=E6hE1-OOGyY",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] my name is trig I'm with Destiny City Electric I'm a licensed electrical contractor here in the state of Washington this is my first sip house and uh I thought I looked at this project having never done one for as an opportunity um to expand my business and also to expand my craft um and and uh what I would like to do is give you some of the ideas of how I was able to go from having never experienced it doing Contracting in the state Washington stick frame uh commercial industrial is my background um but uh I've transitioned into doing some of the residential and so this is my first fo into um into sit houses and so I'd like to give you some information on how I was able to identify um some potential hazards and also uh also to show you uh and simplify the process so that it's easy for you to um take on a project like this I think they're a great home and they have great design uh obviously you want to be involved early on in the planning of it because there there are some ident things that you need to identify early in the process um so that uh that the process runs smooth like any other house would work the number one thing I would want to do in this would be the planning phase sitting down with a uh the architect or design team uh owners to find out uh lighting locations Outlet locations primarily because for me um I want to honor the design phase but at the same time I have to also honor my codes and requirements here in the state of Washington and so involving in that planning phase I need to find out where the service panel is going to go where any exterior penetrations need to be um and then depending on um the type of subfloor you have in this particular installation we have a slab on grade so we don't have any option to do that later so we had to plan every location where we would want to have stups conduit coming up through the floor um and we would want to make sure we could identify those on any interior walls um because obviously anywhere where we had a sip wall the structural you know insulated panel you were not going to be able to bring a conduit up into that area so what we're going to do during this video is we're going to show several ways for us to uh not only creatively but simply run our wires from a stick frame wall into a sip from a sip to a sip both of these on a corner from an outlet to a switch and then transitioning to a corner of another Outlet we're also going to show you uh transitioning in the ceiling from uh a wall to out to the out to the lights and then from a light to a light all of uh and then we're also going to transition um on internal corner so what we have is we have a pantry here and uh we need to put a box in here and I want to come around the corner and feed this Outlet right here so I've got my Chase here and I've planned to come around to my Chase here so I'm going to drill my hole so now I've penetrated through the the OSB pulled out the plug so at this point what we have is we have our void if I continue to drill basically we slide our box in so now I got to get the wire from here to the outlet so now so I've also got a wall here and then these stick frames so this is the transition point between the two holes so so now we uh in any zp wall you're going to transition from the Sip to a stick frame and here's how I have resolved doing that issue so I take a fish stick which you can buy anywhere and you take string which you can pick up at any electrical supply house I stick that through to my hole here and then I've made a hook and what I do at this point I catch my wire I reach through I catch my wire I pull my stick out and now I have a Chase so I've transition from there to there tie this on to your string throw a little tape on there for good measure one of the things you don't want to happen while you're doing this is to lose your string all right using the existing hole and knowing that there's an existing hole there I match it up bring my wire into the box and you've made the transition to the corner [Music] so in this situation what I have uh the way the layout is is I have an outlet and then I've got to come up from the outlet to a switch and so we're setting our switches at 48 in which there's a mark there there's a Mark here there's also a layout here at 9 in and up top at 9 in so what I'm going to do is Mark nine and actually we go top a box at 48 so I go 46 and in this situation we're going 16 top of [Music] box so we have a a vertical chase at this point and then we also have a horizontal Chase so now I'm going to come up to the switch so you see you've got your your vertical and your horizontal and they meet perfectly so your wire actually can transition with with relative ease so we've got a Chase right here and if I just reach over grab my wire and in this situation what I do when I'm fishing down is I I have my string already attached to my wire it also gives me some pliability and in the future it gives me the option of running continuous wire down there so that is how I would pull down now if I want to continue this run and come around the corner to another Outlet I just pull this long till I reach the end that's my switch take my trusty hook so now I've got my horizontal hole I stuff my wire in there stick my rod so I got my string but I don't want to go into here I actually want to transition to this point so I've got a string out I catch my string here push this down to here so then when I've done is I basically just sucked this string back up through here so now I've got a string from there to there I pull my fish stick back I tie my wire on so I've got a continuous string where my two sip walls line up and I I pull my string through here leaving a tail here for my outlet and then I got an outlet there so that's how I would transition from a sip to a sip and then transition up to a switch okay so what we have we have a sip ceiling that we transition on one end to a sip wall and on this end we have basically a Shear wall so to transition from sip to Shear we're using the existing chases that were predesigned by the the Builder and the design team and that came down to this wall so we were able to drill a hole on the reverse side of this Shear wall to make the connection so now we want to go down to go from a light switch up into the zp wall to connect to the lights in this particular installation we have uh this light and then another light this hole only Services as a transition from the horizontal to I guess they're both hor uh from the uh uh exterior Chase to the central Chase so I'm just going to push I'm using a standard fish tape and string again that's my tools of the trade transition that over I will cut my string I will pull my string through so now I have and you can a little bit of fun here very easy but the holes are there everything's easy you know now you can pull your wire so this hole once all the strings are tied tight we can take this covered up seill it up and it's like it was never there so they'll put some foam and some sort on that so again I'm using this pre-existing Chase got to clear it out I push my so now I continue to push the chase this is about 4 feet away from where I'm at right now and I'm just using my fish tape in the string I'll grab the end of the fish tape stick I can pull this back let's get that so we've transitioned now from the switch we've we've pulled our string out to the center we've come to a light and then we've transitioned to the next light and again all using pre-existing chases um and minor drilling or minor uh requirements as far as being able to drill that exterior hole to transition and pull it down the [Music] line so here's an area uh where you have a first floor garage Upper Floor studio and you have uh instead of a full panel sip you've got a sip first floor sip that sits and I have a second floor sip that sits on top and so there's a Chase above and below which we've identified here by drilling a penetration into this wall and there's a hole above both of these we measured laid out drilled the hole in this particular situation we had um we had a an installation where the chases were blocked by blocking so we actually had to take a um a flex drill bit so it's on like a they make this in a 48 in they make it in a 24 in they make it in a lot of different lengths but this is a 5/8 drill bit and we stuck this in the hole at an angle and we went up and we were able to drill the blocking out and then we were able to use a fish stick which we've displayed earlier right here with a string push it up through the hole so you've got a guy on top and on bottom we pulled the string up so now we already have the string through here at this particular installation we're pulling a speaker wire and a uh uh uh a number 12 uh RX NMB so Sean do you want to go ahead and pull it pull both strings tight good go ahead okay nice and easy keep going okay nice and easy okay now just pull one pull the pull the yellow okay okay now pull the the other one good so now that's how we've transitioned from first floor to the second [Music] floor so we've just pulled this wire up from the lower floor to the Upper Floor now we want to transition from this corner to this corner and in this situation we're not going to drill any external holes so we're going to use this fish tape fish just basically your normal number 12 wire and I'm going to stick this in right here and then I'm going to stick this one in to the pre-designed chases you can actually see here where they line up so it's just a basic number 12 wire that we put a hook on so now I'm going to stick this here down through the Chase and this particular one here I had a string on there we go so now I've just with basic fishing techniques that any remodeler or contractor might use I'm able to pull this through and I actually fish this all the way through so at that case I have a string all the way through which I pulled [Music] out these are a couple of uh standard electrical boxes one is a metal and one is a fiberglass uh both of these come in a remodel style these are not these are an additional remodel style but they have screw holes here where you can actually attach it to to um to a OSB sheet of plywood or sheet rock or whatever um in this situation with the ceiling that we have in this project uh I'm going to use both a combination of fiberglass and Metal uh primarily the metal are going to go up in the architectural High ceilings or anywhere where a fixture is going to hang that might be over 50 lb so here we have an architectural ceiling um this is actually the dining room fixture location we've pulled our wire um using the existing chases so we've got the metal box it's good for over 50 lbs we're going to take this up stick it up in here and then uh take a couple of uh you know screws to screw into the uh to the the OSB and uh it's ready for sheetrock looking back at this uh this process and and uh having um going from that initial phase of I would say somewhat reluctant or fearful um but at the same time looking for work and wanting to find uh new ways to expand my business grow my business to stay in business uh sips happens to be something that uh uh is available right now now and I had an opportunity and I have no regrets in doing in fact I I look forward to doing more partly because um it's much more manageable to pull wire uh it's much more um uh um it's very similar to a lot of the work that I do I do a lot of remodel work I do a lot of projects where you're in people's homes and you're trying to do minimal uh damage you're trying to do minimal mess and so this is a lot like that um except I get to get in before the rocker so so in a way it actually makes the project a little simpler on my end um but at the same time um the cost I would say or the the overall uh project expense uh as far as material is very similar to what it would cost for another contractor to do a regular stick frame house if you're involved in the early planning process you can definitely minimize your labor expense you can minimize um the time it will take to produce the project from start to finish [Music]"

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{

"VideoID": "476",

"Title": "Old Work Electrical Box Install #electrical #homeimprovement #wiring #construction #tools #shorts",

"URL": "https://www.youtube.com/watch?v=8BbLtUTgmnY",

"Keyword": "Electrical wiring installation",

"Transcript": "this is how you install an electrical box after the drywall is installed first you mark out for the electrical box I cut the drywall using a utility knife and then I got a Sawzall blade here or you can use a drywall hole saw to cut out for the box and then once you have the box cut out you're going to insert the wire into the old work electrical box and tighten it to the drywall then afterwards install your light and you're ready to go"

},

{

"VideoID": "478",

"Title": "Basic Pool Electrical Wiring Module 2",

"URL": "https://www.youtube.com/watch?v=Iu56IzX-6QY",

"Keyword": "Electrical wiring installation",

"Transcript": "hey this is craig the pool man with pool specialists and today we have module two of basic electrical for a pool now we're going to talk about circuit breakers which is what we have here and we're also going to talk a little bit about relays okay so there are effectively two different types of circuit breakers this is what i would refer to as a standard circuit breaker and that would be on that would be off this circuit breaker does not have ground fault isolation protection this is what's called the gfi or gfci breaker depending on what kind of terminology you want to use and it does have ground fault isolation so therefore if you were to have water coming to contact with the electrical on the other end of this it would automatically trip this breaker however it may not necessarily trip this breaker so you'll notice that this has a pigtail on it this pigtail would have to be secured into your neutral bar and then your power for 240 volts one would come out from here one would come out from here if you happen to have a neutral then that neutral would have to come back to here you could not put it into the neutral bar if you put a neutral into the neutral bar instead of here this breaker will automatically trip however when you're wiring up a pump or a salt system or something of that nature that has 240 volts typically it does not have a neutral the only time you would have a neutral is if you are also going to wire in things are say 120 volts and therefore it will be able to determine what the current going out is and what the current coming back in so when you turn this circuit breaker on this is going to monitor the current going out of this 120 volts and the current going out on this 120 volts and the voltage and if you if it sees a differential in voltage of six tenths of a volt or more then it will trip and that's how this actually works if you were to buy a cheap one or an inexpensive circuit breaker such as an eaton breaker they are really not designed to work with pool equipment and i would strongly recommend that you do not use the less expensive breakers this breaker right here is probably about twice the cost unfortunately the only company that manufactures the breakers that are designed to work with pool equipment is siemens all the other ones are not designed and if you put them on particularly a variable speed pump of any manufacturer it will arbitrarily trip and the last thing you want it to do is you do not want it to trip in the winter time when you're in freeze protect and that is the most likely time it's going to trip this circuit breaker was developed in conjunction with pintair so if you purchase the pantera brand you're actually going to get the exact same thing and what it's doing is it's actually looking at voltage that may be in your bonding and voltage in your ground and so therefore it has a way to isolate it out and it doesn't falsely trip um from what's called stray voltages so you'll notice that this is a lot bigger if you look at this breaker and you compare it to a standard or a inexpensive gfi breaker it's about the same size and that's because it doesn't have this the additional electronics in it that provides the isolation so this is predominantly what you're going to use code really doesn't allow you to use this anymore for the most part in pools you are always always going to use the gfi so this is a double pole giving 240 this is a double pole giving you 240. then if we come up here we're coming up to what are called single pole breakers so this is the standard breaker again that's the on position that's the off position when they trip they typically go in the middle but sometimes they will come all the way to the off this is the gfci version of it and you'll notice that it has some electronics in it as well so that it can determine if there's a false trip um this happens to be a square d breaker which this is a good quality breaker and again you'll see the pigtail typically when you're wiring up lights you're going to use a gfi or a gfci breaker and again very important is this pigtail needs to be connected into the neutral the neutral wire coming back from the whites and or whatever you're feeding this with needs to come in to this circuit breaker so the power will come out of this and the neutral will come out of it because that's how this breaker monitors whether there's water or short or a problem with the line so very very very important this is a gfi breaker and you need to bring the neutral back you cannot co-mingle neutrals so each neutral is going to have to be dedicated to what you send it to if you co-mingle neutrals then this will trip so when you're wiring this box up you want to make sure that you pair up your 120 volts circuits the power or the hot wire with the neutral and the neutral wire comes back to this circuit breaker okay this is just a standard breaker most of what we do in the pool industry you really can't use this breaker however i use a standard breaker to actually provide the power to the control box so here's my transformer um it's going to get configured and wired up so that it's going to run on 120 volts so the other thing is you cannot have a gfi outlet or gfi breaker on a gfi breaker it will not work so this is a gfi outlet and what you'll notice is there is some yellow tape here and that yellow tape is telling you that the this is where your output goes so your input is here so if you were going to feed something that would have the protection of this outlet it would come out of here a lot of pool builders use this for their lights instead of using a gfi breaker i highly recommend you do not do that and you would not feed this through your lights there's a nice little panel here where you can put your outlet and many places the code requires that outlet to be there on an equipment pad and so i would have a separate circuit breaker for your lights do not feed them through here also do not feed the controls for your panel through the light breaker or through this gfi outlet because if either one of those trips then this turns off and if that happens in a freeze protection standpoint you are not going to be happy because that's going to cost you a lot of money so here's my gfi outlet if you look this is brass black goes to brass white goes to silver green goes to green so this is my ground this is my neutral and this is my power and you're going to find the same thing over here so my black is going to come out of the circuit breaker and it is going to go here my white wire which is my neutral wire is going to come out of here and go into my neutral bar and then my ground is going to come out of here and go into my ground bar there are distinct differences between your neutral and your ground you you do not want to co-mingle these two in old old circuit panel boxes they are commingled and um the ground is the same as the neutral but in the current codes this neutral bar has to be separate from the ground bar the grounding bar as you can see is actually attached to the box and then also the bonding lug is attached to the box so you're going to find that your bonding is going to be connected to your ground if you notice this this is actually isolated from the box and so if you were to measure the conductivity there is no connectivity from here to here or from here to there or from here to the um bonding log so gfi outlet has to go back to a regular outlet it cannot go back to a gfi outlet it will not work it'll falsely trip so i would recommend that you get the 20 amp you also get the tamper proof and you get the weatherproof so you're going to see it's typically like a wt is what is going to be on the rating for this gfi circuit breaker and then you are going to also want to put a cover on this on the outside so that the water does not get into the outlet and cause it to fall for falsely trip now this top breaker right here you're gonna see takes a single slot and it actually has a 20 amp circuit here and a 20 amp circuit here and that comes off of the same phase i like this breaker particularly when i'm setting up a control panel because the first breaker i am going to use to go and drive my transformer to provide the power for my control panel the second breaker i'm going to send out to my gfi outlet which is going to be mounted inside of the box and so the nice thing about this is it's only taking up one slot but it's giving me two circuits coming out of it again it's where this circuit gives me 120 volts in what i'll call phase one and this gives me 120 volts in what i'll call phase two so i wind up if i measure the voltage i get 240 volts where if i measured the voltage across here it would be zero because it would be exactly the same 120 volts here and the exact same 120 volts here so you would measure from here to ground or here to neutral and you get 120 volts and when you measure from here to neutral you're going to get 120 volts as well those are your standard circuit breakers that's what you're working with very rarely do you ever use a regular circuit breaker in a pool panel you're using it one two for the control panel and to to feed your gfi circuit breaker that is pretty much the only reason why you're going to use that so keep in mind these are relays up here and they take the low voltage that this board provides and turns on a coil in here which then closes this connection to this connection and then this connection to this connection so typically this is going to be what's called your line or your power in and this is going to be your load which is your power out again this is line in power out so if you have this can handle 240 volts so i have 120 volts on the one phase coming in here 120 volts on the other phase coming in there if you measure the voltage from here to here it would typically be 240 volts and then if this relays turned on then if you measure from here to here you would have 240 volts you can also just use one side of this um i.e if you're using this relay for a light then you would have 120 volt your line coming in here and your load coming out of there i tend to also like to bring the neutral line into this relay um it just makes it a little bit cleaner and i know where things are um it actually helps prevent false trips to the gfi circuit breaker so if this was going to be a light relay i would bring my line voltage in here from this to here and then my load voltage which goes out to my light would come out of here then my neutral wire which again is coming from this circuit breaker is going to go here and my neutral wire going out to my lights is going to be here so that's the way that that works all right let's talk about this transformer over here there's a diagram we're going to show you that tells you how to hook this up what colors go to what if you're going to hook this up to 120 volts or what colors go to what if you're going to hook it up to 240 volts and here is a picture of that connection okay you can see that in the 120 volt version i have it says to connect the black wire to the 120 volts and it says to connect the violet wire to the neutral and then i'm going to put a wire nut and it's very very very important that you put a wire nut on this because this has live wire and if it bounces around and hits the ground or hits the neutral it will blow out this transformer it will trip things it'll cause problems so make sure you put a wire nut on that so if you're hooking up 120 volts this is my power this is my neutral this is has a wire nut on it now if i'm hooking it up to 240 volts because a lot of people like to use 240 volts sometimes they use the same circuit as their pump sometimes they use some other circuit um then you can see in the wiring diagram that black goes to the one line of 120 volts the violet gets the wire nut on it and again very important that this gets a wire note on it that is not allowed to touch the ground or the neutral or whatever so make sure you put a wire nut on that and secure it very good and then your yellow would go to your other line i.e i'll call it a second phase of 120 volts so if i measure from here to here then i'm going to have 240 volts when it's connected and this is going to have a wire nut on it so that's the basics we're going to go out to the field now we're going to put this box up we're going to put some wiring in it a bunch of labels on it and give you an idea of what this should look like when it gets wired up all right we've taken our panel out to the job site and we have installed it so let's go over some of the details that we've got here first of all i want to point out that i believe in labeling everything this makes it so much easier in the future when people come to work on the panel if you have to make any modifications fix things is just a whole lot more traceable so you will see if you could read this one it says salt system so that's the conduit that goes out to the salt system this is a conduit that goes out to the filter pump this is a conduit that goes out to the pool lights this was something legacy um we pulled out an old hayward control system that just doesn't function uh typical hayward problems so we just went ahead and wired this up to the same breaker that they had in the hayward system which was a 30 amp breaker i have no idea where this goes so but other than that everything is labeled as far as conduit i'd like to point out that i believe that we should always put a gfi outlet in on the side of panel they already have a hole for it make sure you buy a nice waterproof cover and um you know you're talking about maybe an extra 30 bucks here i i would charge you labor to put it in plus the parts you're already there but from a service standpoint it makes it so much nicer if you might need any 120 volts there technically in a number of places they would require an outlet to be within x number of feet of the equipment panel so this would then meet that requirement if we trace back our hot it comes back up here and it goes to the circuit breaker that i spoke of a little bit earlier and you'll see that this is a 20 amp circuit comes down to here and then the white wire goes up into the neutral bar bus and then the ground goes into the ground bar bus notice that this is not a gfi breaker this is a standard breaker you cannot feed a gfi outlet with a gfi breaker it will trip it causes problems there's interference between the two so never never never hook up a gfi breaker string strung to another gfi breaker or strong to a gfi outlet okay that's basics then this first breaker you'll notice that i have my control panel wired into this so if you looked it to diagram on the control panel it says that the black goes to hot so the black comes into here and then if i'm using 120 volts i take the violet and the violet then gets fed into the neutral line and then my yellow wire has a wire nut on it do not leave this wire nut off because if that grounds out it will blow out the transformer it will trip the circuit breaker it will do all kinds of nasty things because there is voltage going through this wire so always always always wire nut it okay so that takes care of our control that takes care of our gfi outlet next we're going to talk about our lights so the lights have to be on a gfi breaker please do not run them through the gfi outlet yes you can do that but the people plug things into these gfi outlets and then they trip them and then you get a service call that says well my lights aren't working and you go out there to find out that the gfi breaker was tripped because they plugged something into it stuck the electrical cord in a puddle of water who knows what they did so always have your lights on their own dedicated gfi breaker and you'll notice that this gfi breaker goes up to this relay and there is my line side the load side i actually have two sets of pool lights that it's driving so it's going down into my pool light condo and then you'll notice that the neutral wire coming back from my pool lights and you cannot commingle neutral wires both of these lights are going to the same place they both use the same neutral wire so we're okay there but if you have other stuff you can't share this neutral wire this neutral wire comes up and it goes into the gfi circuit breaker then there is a pigtail that comes out of the gfi circuit breaker and goes into the neutral bar this is imperative that you do this if you put this neutral wire coming back from the lights into the neutral bar every time you turn those lights on it will trip that circuit breaker it will not work so be aware that this has the hosta has to be there so that takes care of our lights then let's go down to our filter pump okay so by code we have to have a gfi breaker on the filter pump uh you basically have to use either a siemens or a pen tear breaker they are the it's one in the same and they are the only breaker or is the only breaker that is actually designed to handle pool equipment there is a lot of what i'll call ground noise or could potentially be a lot of ground noise brought in from the bonding if there's stray voltages running through the crown and those stray voltages would falsely trip this circuit breaker so if you think you're going to save yourself and go out and buy an eaten circuit breaker it's not going to work it will work intermittently but god forbid this circuit breaker trips when you're in freeze protect and then that's going to cost you thousands and thousands of dollars so yes this is twice as expensive as an eaton circuit breaker or what i'll call a house quality breaker but it is well worth the money so you'll notice that the you've got 120 volts coming out of the one side and that comes up to our relay on the line and then 120 volts coming out of the other side coming up to the line okay you'll notice there's two wires that are attached here and that's because we have a variable speed pump that variable speed pump must have be hot wired and have power all the time basically the power head on it is a computer and that computer needs to be both needs to be up and running and ready to go when the control system starts sending it information so if that control if that variable speed pump is not booted and running then it can't receive the information from the control system and therefore it's not going to work correctly so that's why these are hot wired in so if you file that down that goes down to my filter pump so that filter pump is hot wired if you have a pentair filter pump variable speed it has a display on it and that display must be lit all the time whether or not that filter pump circuit is on if you have a jandy variable speed pump then you are going to have to take your volt meter out go inside and make sure that you have your 240 volts going to it now also very important is that your salt system must must must be switched by your filter pump this is a safety mechanism and it is code in most places so you'll see that if you follow the load side of this relay it's going to come down here and go in to my salt system conduit now a little bit hint for anybody that's putting in variable speeds variable speed pumps and control systems those variable speed pumps are very very energy efficient when you run them at a low speed it's basically pulling the same amount as 100 watt light bulb or very close to it and so typically you are going to run that filter pump 24 7. running the filter pump 24 7 will actually make it last longer pumps motors are made to run they you know at this point the only moving parts they have are bearings the bearings will last a whole lot longer if they don't sit and get moisture and rust and dirt in them so run it 24 7. so the trick is you set your filter pump circuit to run 24 7 and you set it at a low speed you want to set it at either 1800 rpms or 30 gallons a minute the reason why you do that is because the salt system requires 25 gallons a minute in order to trip the flow switch and you want this salt system to be generating salt 24 7. so if you set your low speed to be 1800 roughly or 30 gallons a minute then that salt system is always on and then you use your features or other auxiliaries to run the pool in what would be called high so you may have a high mode so that you run it in the morning so that you've got a lot of flow to clear all the dirt off the top of the pool and then a lot of people will run their spot spill over at night again that's going to be at a much higher speed help clear off the pool if you've got waterfalls or something like that those are all going to be at a higher speed the higher speeds take priority over the lower speeds so if the pump is running at a low speed and you tell it oh run at a higher speed it's going to run at a higher speed it the highest speed will always take the precedence or priority so very important that you understand that concept so that is our basic electricity you'll notice it is very important that i have my neutral wires separated from my ground wires and everything is in its spot next i want to go over some more labeling issues you'll notice that i mentioned that this is for my filter pump this is for my lights well on the door of this it actually has a diagram of these four relays so as you can see i have my filter pump which is already labeled they assume you're going to use really the leftmost relay for the filter pump and then because i used auxiliary one the next relay for the lights i labeled that if i had something else on auxiliary 2 i would label that if i had something on auxiliary 3 i would label that that way when somebody comes to services they know exactly what relay is running what device additionally when you get into the low voltage i like to label all those wires coming in so you'll see that this is the filter pump and that's the control for the variable speed this is the salt system this is the screen logics and then this is just a jumper cable going back to the 485 com port connector on the main board so i it is very imperative that you don't double up wires if you start doubling up wires you start running into problems so the other thing is if the system locks up and fails you want to be easily able to isolate out what's causing the lockup and generally speaking your 485 com port fails on a device maybe the salt system maybe the filter maybe the heater who knows um but when you're debugging this you want to be able to pull each one of these out individually and you're going to want to know what it goes to so label everything it just makes it so much easier in the future when you're doing repairs or expanding the panel this then of course connects to my control board my control board looks like this so here is my wire coming from my port expander and it is going into my comport or my rs485 connector now if you happen to have the easy touch or the intelli touch with the salt system there is expansions on that salt system it gives you an extra two ports that are connected together however that's generally not enough so always when you're quoting the system and putting it together always go ahead and quote in and add in the port expander it's it's trivial as far as costco and it just makes things cleaner neater and much more easy to diagnose so you'll see the other things on the back of this board this is if i had a spa side switch that it would allow me to connect up to there it would go and then here are my sensors i've got my air temp sensor i've got a solar temp if you happen to have solar and then you would also have your water temp sensor so i can't remember which one of these one of them is water one of them's air or vice versa so just be cognizant of which one is which and make sure that you've got the right one hooked up you'll know immediately once you pull up your screen logics and you start looking at the water temperature and the air temperature becomes intuitively obvious this is the connector what's called a dry contact relay for my heater so i would go ahead and i would connect my heater up to here and then it would go to what would be called the fireman switch on the heater that would shut the heater off turn it on so that this control system is actually controlling the temperature of it here's my plugs for my relays so my left most rela then the next one over the next one over and the next one over i like to keep it very methodical again it just eases up the whole concept of debugging the the system when you have problems or you're making expansions to it this is a actuator and the actuator in this case is plugged into valve a this goes back and then in my program i have it set up so that i can pull the water from the basin of the infinity edge causing the infinity edge to overflow so in this particular pool they have a single pump that handles filtering the pool and then also handles taking the water from the basin and returning it to the pool so that i have a spill over you'll notice that i alway i'm big on label so this comes with filter pump on it and then of course i added this label for the lights next to it if i had other features that i was adding on i would go ahead and put those labels on here as well now you have more labels than you know what to do with therefore what i do is i keep them in the plastic bag and then i tape them to the back of the high voltage cover and so you can see all the extra labels in here and so now if somewhere is down the line they decide to add a water fountain or extra pumps cleaners whatever they might be adding then i already have the label here and i don't have to go searching for it if you want more labels you can call up pentair or jandy and i'm sure they'll be happy to send you sheets of these labels free of charge if you're a service company so go ahead and leave these on at the system for the convenience of somebody later on again you'll notice labels so if you put the front panel on that i have the controls labeled each the gfi outlet is labeled the pool lights the filter pump salt system if you had a heater that would also be here now it is code in most places that the circuit breakers must be labeled so if you were getting this inspected and you did not have these labels then you would be failed now they could be as simple as writing this in with a sharpie i tend to want to be a lot more professional so i just bring a labeler with me and then everything looks nice and pretty and neat and conform so label your circuit breakers that's a must for passing inspection you'll notice that there is no door on here so for the convenience factor i have removed the door and it just makes it a whole lot easier to work on the system without the door and that's very very easy to do so if you look on the side of the panel there is a screw right here and you will have to remove that screw and then when you open this door it will come up and allow you to take it off so if you take this screw out then it allows this door to get pulled off and it is a whole lot easier to work on the panel with that door off and then once you finish your job go ahead and put the door back on and please put the screw back in so that it can fall off that concludes module number two of basic electrical for pools i hope you found it educational and informational if you did please drop us a like subscribe to our channel thank you so much for watching and have a great day"

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"VideoID": "479",

"Title": "Electrical Wiring How to Install an RCD",

"URL": "https://www.youtube.com/watch?v=qRE58D0Zh\_k",

"Keyword": "Electrical wiring installation",

"Transcript": "hello and welcome back to another electro technology video today we're gonna learn how to put an RCD in place of a circuit breaker so let's have a look [Music] so today I'm going to replace a circuit break up on this demonstration board and I'm gonna replace it with an RCD combination the difference between a circuit breaker and RCD is very simple a circuit breaker is an overload current protection device which means if the circuit breaker is rated at 10 amps and a fault current appears on the circuit for whatever reason that wants to pull maybe 14 amps then the circuit breaker recognizes there's too much current and it trips out creating an open circuit and therefore isolating the circuit and keeping it safe but it only works as overload current whereas an RCD is a residual current device and that looks at the imbalance between the active and neutral and if this if it sees a problem there then it will trip out and create an open circuit and then make the circuit safe at the same time this one I'm going to install is a combination which means it also has the overload protection of a circuit breaker as well when you're installing this equipment you need to make sure that you are getting both the combination otherwise your RCD is not going to have that overload protection on it so let's have a look at how we go about actually taking this apart and changing this to an RCD because it's not a simple process it's not as easy as just popping it out and putting a new one in we do need to add a little bit of extra wiring so let's get to it now before we get started we've got to make sure we have all the correct gear so I have my pliers insulated pliers I have some screwdrivers these are the three screwdrivers that I like to use the most so it's a medium flat a small flat and a medium Phillips head I find it I can do no mean of the jobs with just these three screwdrivers obviously we need our RCD so I plan on changing the 16 amp circuit breaker which is controlling the circuit for the GPOs that means I need to have a 16 amp RCD so that I'm swapping out like for like to get the correct current size and I'm going to need some cable in particular I'm going to need some neutral wire so I've just grabbed a piece of TPS a lying around from another job here and I'm going to utilize this so I'm trying to minimize as much wastage it's possible so I'm just going to take this apart like so that is the neutral wire that I want the black wire that is pretty close to the correct length so there probably won't be any wastage from this wire obviously this is now no good as TPS but I can take that apart and I could always put some of this stuff aside if I need some small earth wires or active loops for something else on another job so I'll put that aside and this will get thrown away okay so now I have all of my materials I need for this job I'm now going to hook this board up hang it up over on the wall and I'm going to take you through the process of removing the circuit breaker swapping it over for the RCD and wiring in the extra neutral wire which is now required should be noted that as of January 2019 all circuits on domestic dwellings must be protected by our CDs if they are currently protected by old rewiring fuses or circuit breakers that's perfectly fine but if there are additions or alterations made to that circuit they have to be brought up to spec which means you have to install one of these on there so please keep that in mind that is now mandatory for all circuits it used to just be the power circuit and the light circuit now every circuit so that's air conditioners everything so let's go hang this board up okay so we have the board hooked up now and the first thing we're going to do is we're going to remove the cover I've already taken the screws out so that will just lift off like that so what you'll see at the moment is this circuit breaker here is kind of acting like a main switch usually the main switches will be red we've just we bought these at the time because it was cheaper than buying a main switch so this is a 32 amp which means it's got enough amperage to cover these other circuits so a main switch mind you is also not a circuit breaker so it does not have any overload current protection or anything like it is literally just a switch so please keep that in mind now the wiring for this the way it's worked is the supply which we have coming from this plug comes into the main switch through the main switch out of the bottom of the main switch and over to the top of the first circuit breaker and then it loops to the other circuit breaker and in each of the circuits then lead off to their respective places in the building we need to change this one here on the end and make this one an RCD realistically we will be changing all both of these but for today's exercise we're literally just gonna be changing that one so the first thing I need to do is I need to take off the link and I'm going to take off the circuit wire that's heading out into the building [Music] okay now I've got these two wires taken out obviously if I was doing this job on a building I would have gone through my seven steps of isolation to make sure everything is okay first but of course this is not hooked up this is just a demonstration on the actual wiring the circuit breaker is now free now under the bottom of the circuit breaker there is a little tab there which I can just pull down with my pliers there we go I'm out it will just lift off and if I turn that around you can see how that mechanism works it just clips in to what we call the din rail which is at the back there so now that's off I can take that out and I can get the RCD ready to go on now as you can see the RCD has a very similar mechanism which will allow to clip onto the din rail however before we can connect it up you'll notice we need some more wires we need a neutral as well as our active there and we also need a neutral and an active there notice that this tells you that this is the line side and this is the load side so this is a side that officer goes out to our circuit just like we had it wired up before this is a side that's coming from our supply so we need to bring a neutral from our consumers neutral link to here and then we need to run another neutral out to our circuit which in the past our circuit neutral would have been connected up to the neutral consumer neutral link that's no longer the case so I'm going to grab a neutral wire and we're going to hook that up so here is my neutral wire you can see I've already pre twisted the cable ready to go through so I'm going to pass this through here into the back this will then go off to my neutral link I'm just gonna fold that over so that sits like that and then I'm going to attach that to my neutral link over here there we go so unlike my neutral link currently what I have is I have the consumer consumer Maine's coming in and I have the circuit load at the moment which I'm now going to take the circle load off and I'm gonna bring the circuit load over to back to here and then this new Y that I've just fed through will then go to the consumer neutral link that way then give me the supply neutral and a load neutral so you'll notice on our neutral link that we have here this is the consumer neutral coming in this is goes to the first spot on your neutral link and then afterwards we match up the neutral link numbers to the number of circuits so circuit number one would go in the first position circuit number two would go in the second position and back here this was our circuit number one because remember this is our main switch that circuit number one and that circuit number two so the second position along that will be the correct load neutral for that circuit that has to be done so that if you're working somewhere where there's a lot of circuits it's very quick and easy for you to identify which neutral is which so if you have to disconnect a circuit you know exactly which neutral you are undoing because you don't want to undo a neutral to a live circuit so that would be not advantageous and potentially dangerous [Music] [Music] okay so I've tightened that up you'll notice that I have made sure that the insulation reaches the edge of my mounting block there it's not being pinched by the screws and there's no excess copper outside that's a very good habit to get into even though this is going to have a cover put over the top of it you still want to do that because if you get into the habit then when you do your other terminations you'll still be abiding by the ASN zls 3000 standards which is what we have to follow okay so now I have my consumer neutral over here and I will now bring in my load neutral there it is there okay with the RCD what I will now do is I'll connect up the mutual here now keep in mind when you're doing this make sure that these screws are screwed all the way out correctly sometimes they're not and then you try to put them in and your cable can get jammed just in the wrong spot there and it doesn't tighten up so make sure that it's screwed out correctly on both ends so you can see this one's a little bit different from this one and that way you'll know you'll get a good connection so I'll put that tuck that in like that and then I'll screw that up now this stage this screwdriver I'm using is a little bit large for this this circuit breaker and this is why I use a small one so let me grab the small screwdriver and I'm going to tighten that up with that small one [Music] never over tighten any of your terminations nip them up so that they're tight and it's not going to come out give a bit of a wiggle but don't over tying it to the point where you're stripping the head of the screw you don't need to do it that tight but it's not exactly going to be rattling around you know on the on the machine or something like that now I've put my active in as well and I'm gonna do the same thing tighten up my active so now my load side is connected sorry now my supply side is connected I can now bring in the load side now you can see in this case that copper is sticking out too far okay so I'm going to need to trim this off so I'm going to unbend this give a bit of a trim reef redo this fix this up set sits nicely underneath there the active is okay but this neutral is not so good so let's fix that you would be surprised how often you go out to jobs and you'll find this is a case somebody else has been there before you they've done some work the work is not particularly brilliant and you have to then just tidy their work up if you don't do that you do run the risk of having faults in your circuit and there's the potential for harm and the potential for fire as well so please keep that in mind there we go that's nice even my copper is not coming past my insulation so that will fit quite nicely into the circuit breaker the RCD I should say it's not a circuit breaker there we go looking good I'll tighten that up [Music] occasionally very occasionally you can get defective devices and this is a good example one that screw is actually jammed in I cannot get that to move at all so this this RC D is actually no good I'm gonna have to throw this one away and buy another one but for the benefit of this exercise I'm going to put that in and we'll just assume that that is correctly tied in and then as we did before when we took the circle breaker off we're going to bring that little latch down that will hook onto the din rail and then we'll push that latch back up so it stays in the right spot I didn't put it on the din rail properly there we go okay so that's now sitting not bad it's also again maybe this is just as this particular brand of our CD but you'll notice there's some movement there it is on the din rail but it's not really sitting very well so that's something else to be a bit mindful of two different brands they're supposed to all be the same but that's not always the case so be mindful of that always buy decent brands what can you do anyway it's in there for this demonstration so now that's done I can now put my covers back on and that is basically how you wire in an RCD including when you come across problems so boards done our CD is in as you can see sometimes things don't always go to plan this our CD was clearly faulty it's very rare but it does happen and I'm kind of glad it actually did happen in this video because I can show you what you need to do when things do go wrong that our CD doesn't sit and I see the covers now hold it in place but realistically it should sit on that din rail correctly and tightly but it didn't do that the other issue was obviously that it the screw would not screw down and hold on to our active cable you can't leave a job if it is like that even if the screw is really tight you're screwing it you know is it and and you've got it's bitten into the copper if that screw is really really tight to turn by itself with nothing in it then it is no good throw it away get another one don't risk it okay so it's installed and basically the way it works is you can test your are CDs because they have a trip button so when they're energized you can press a trip button and it rips it out and it it checks to make sure that everything is okay it's just a good way of testing things that is it for learning how to put an RCD onto a board I hope you got something out of that and I'll see you in the next video [Music] [Music] [Music]"

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"VideoID": "480",

"Title": "DIY Electrical Wiring Basics for Hot Tub Installation",

"URL": "https://www.youtube.com/watch?v=mTlqGS81B-k",

"Keyword": "Electrical wiring installation",

"Transcript": "hey folks turbine guy coming back at you today i want to show you a quick and easy install for a hot tub it's really not that difficult and i think just about anyone who's a little handy can do it don't forget to check your local building codes to see what building and or electric permits you're going to need to install your hot tub you're basically running three wires from your breaker box up here two hots a neutral and then you gotta run a ground as well so if you look and see what i've done here is i've taken the side of the hot tub off and i took the cover off of the cabinet here and then i ran my wires and i've got them running till one hot too hot in my neutral and i've got my ground coming up and in here too so then i have those running from the disconnect now on the disconnect i got those two hots of the neutral coming in but i've also got two hots neutral and of course the ground coming in from the house the wires coming from the house our standard six gauge romex as opposed to the thn i'm sending out to the hot tub for wet locations so that's going to be the hardest part when you're doing this is trying to figure out how to run that wire and run it in a professional manner now i've got a 50 amp breaker for this and you need to look at your hot tub manual to see what size i needed a 50 amp breaker which meant i need six gauge wire so that's what i'm running in this system is a six gauge wire turbine guy only likes to use copper wiring is it is much better than aluminum and don't forget to check the national and electrical code ampacity charts to ensure that you are using the proper size wire for the current rating of your hot tub let's go down to the electric panel and take a look now we're in the basement and we're gonna see how i ran the wire now i've got the wire right up here and it's a six gauge triple wire with the ground in it but i had to run it through the crawl space which wasn't an easy job and that's like i said upstairs the hardest thing to do is figure out where to run it so we got it tacked up all the way around and we got this guy coming down right in the top of the electric panel and i got it on my 50 amp breaker and this breaker is a gfci breaker you got to remember that gfci breaker it's a water area you don't want no one to get electrocuted here's a close-up of the ground fault breaker i put in for the hot tub it is a 50 amp double breaker and you can see we've got both hots coming in on either side where they belong the neutral from the hot tub coming in the ground of course is running over to the ground bar and then the neutral coming out of the gfi is hooked up to the neutral bar as is required so there you have it folks you got the wiring from the breaker up to the hot tub pretty quick and simple a little bit tedious but i know you can do it turbine guy signing off"

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"VideoID": "481",

"Title": "Boat Electrical Wiring Made Easy, From The Ground Up, Part 1, Comprehensive Guide",

"URL": "https://www.youtube.com/watch?v=ycTi1SLmods",

"Keyword": "Electrical wiring installation",

"Transcript": "hi this is richard from bird fittings and today we are looking at boat electrical systems and what i mean is a whole electrical system from the ground up so starting with the boat battery going through the master switch we're looking at switch panels lighting float switches bilge pumps navigation lights a buzz bar and the idea is this is going to be the first of a series of videos which will guide you through the process and hopefully be useful for people who either have to do a bit of electrical maintenance on their boat or perhaps you do have to install your electrics from scratch like i'm mimicking here i hope you find it useful um if you do please give us a thumbs up and subscribe to the channel i don't happen to have a spare boat to hand which needs wiring up from scratch so what i'm gonna do is make a buck to install these components uh we've got some plywood panels and i'm gonna assemble a as say a buck where i can install these components in this kind of way you'd find them in a boat representing the different areas of a boat such as the engine room the cockpit area the bilges the interior cabin space and the idea is that that will allow us to come and look in a bit of detail at how the wiring is going to go from one area to another the kinds of connections and methods to put it all together this so wow so well glad to have got all that out of the way that was quite exhausting but now we have the plywood buck which represents zones of the boat we've got the engine bay down on this side we've got other areas of the bilge here where we'll put a build bumper float switch we've got the companion way down into the cabin space as base for the main switch panel build pump switch and then on on the other side we've got the main cabbage space and an area representing the parts of the boat under the floorboards so what we're going to start with is the battery terminal connectors and these thick heavy duty battery leads which we're going to connect to the electrical master switch which can isolate all the electrics to me this is a very key thing on the boat you will just want to have a switch that will turn everything off when you leave the boat turn that off even take the key with you you know everything's kind of let's say safe from an electrical point of view because you've got no power going to anything this is a buzz bar um which if anyone's done any electrics on cars the key thing with with it with a car is the the whole body shell is is steel usually which means you can use the the body shell as a one big earthing path or we think of it as your your negative terminal that is the whole car itself now with a boat they're usually wood or fiberglass so that doesn't work so what you have instead is a bus bar which is a way of distributing the negative uh side of the electrics so we look a bit more at that and the other thing we're going to look at is switch panels switch panels come in different kind of styles and sizes is a few of the ones we we have at boat fittings this one this particular one is a waterproof switch paddle comes with a sort of old style 12 volt it's kind of cigarette lighter socket on the back we've got fuses we've got the individual switches to wire up to here's another style the switch panel which has fuses accessible from the front and it instead of the car cigarette lighter socket we've got a more modern usb type socket there the particular switch panel we're going to be focusing on for this guide is this one here so we've got the row of uh rov switches we've got a row of fuses which are accessible from the front of the panel and if we flip it around a couple of things to point out we have a uh built-in buzz bar on the positive side so we're going to have one positive feed going to this buzz bar and we've also got this earthing buzz bar negative earth buzz bar so we're going to take a negative feed to there these internal leads come from the fuse so everything's protected by individual fuses to the to the switch and we also have some these switches light up when they're on so it might seem a little bit confusing at the moment but uh we'll make it clear when we get to the next stage of worrying in the first component so i've seen these quite commonly installed actually underneath the um the engine cover so that it's less accessible to any kind of intruder i've also seen them inside the cabin space and that's what we're going to do do here we're going to turn to the bit of the switch you would access that's going to be inside the cabin space one thing just in terms of positioning this is if you're going to have young kids on the boat you might want to choose a position where they can't easily get to it and turn off your electrics as they're fiddling around while you're underway so i've now got my master switch installed and the other thing we're going to look at is the battery leads so positive and negative everything starts here really the negative lead will go to the negative terminal on the battery and we are going to connect to the buzz bar once we've got it attached the positive lead we are going to attach to the master switch so we are going to unscrew one of these terminals put the positive lead on [Applause] okay so next we have the buzz bar on the boat rather than having to have a wire from each component back to the battery you have one wire to the battery and and then all the individual negatives can come into the distribution bar to make life a bit easier on the wiring and then we have these plastic covers which go into place so that once you've wired everything on that you want to it keeps it safe from accidental short circuits so i'll pop that off for now so we don't lose any bits okay so now we've got the key bits of our wiring and circuitry that goes to the main battery and we work outwards from these to the other other things we're going to install in the boat so next up will be the switch panel just to say on these switch panels very few if any are really truly waterproof so you've got to think about where to position it i mean i would expect to see that on a say a sailing cruiser to be inside the cabin inside the main cabin probably just inside the main cabin so you can get to it easily um from the outside but not outside in the cockpit where it's going to get splashed and probably not work for very long so yeah just think about kind of ease ease of accessibility but keeping it high and dry as far as you possibly can so that's again where we're going to end this first part of the video so we've got some of the key components installed and then in the next part part two we're going to start wiring things up adding components uh into the system and hopefully make it really easy and simple to understand so i hope you're gonna find these guides uh useful please give us a thumbs up and subscribe to the channel thanks for watching"

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"VideoID": "482",

"Title": "single phase electrical 240v wiring installation in home",

"URL": "https://www.youtube.com/watch?v=Vn4\_h8kqMzk",

"Keyword": "Electrical wiring installation",

"Transcript": "hey [Music] so [Music] so [Music] bye oh [Music] [Music] [Music] you"

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"VideoID": "483",

"Title": "Installing our new 24kw Generac generator with electrical wiring.",

"URL": "https://www.youtube.com/watch?v=\_IDluE3fEoc",

"Keyword": "Electrical wiring installation",

"Transcript": "welcome back friends to part two of our generator install we got the uh the pad poured last time and let it set over the weekend and i've wet it down a few times just to keep it from cracking and i think it's all set we're ready to go so got the rest of the parts from the store today that i'm going to need to hook it up so we're going to go ahead and set the generator on the pad run the electric line and the control line over to the transfer switch mount the transfer switch on the wall with a little chase nipple between the panel and the transfer switch and that way the only thing that will leave is cooking hooking up the main power to from the meter can to the transfer switch and then from the transfer switch to the house the panel but i can't do that until we pull the meter when we get our permit so we're gonna get it all set up and ready to go then the gas company can come and do their thing and then we'll be as soon as we get our permit we'll finish it up so thank you all so much for joining us hope you enjoy [Music] so wow that's sweet goodness so i'm going to be using a two and a half inch uh two of them actually male adapters to make a chase because that's the biggest knockout that i have in my panel so i'm going to use that for a chase that we've got to run two sets of service feeders through there pipe right now for a stick of two and a half inch pipe is 45 bucks so i got this 45 it was like eight dollars i'm just going to cut what i need off of here because i just need a little piece to go between those two male adapters so i'm just going to use part of that and save myself thirty five dollars forty dollars it's totally safe a method only lost one finger so that's good just kidding didn't lose any fingers [Music] only really two tools that you need in electrical that's your hammer clients and your screwdriver chisel okay okay all right so what we're gonna do for the two and a half inch chase it takes a three inch hole saw so these things right here are outrageous you want to make sure you get the right size the first time so we're going to measure down what the distance is from the panel because we're going to keep the bottoms all level and make the same marks on here and drill it out so it'll match up that's the inside of the transfer switch there's plenty of room to come in down here so we're going to come out of the meter can come through and that'll connect up here where it says utility source and then it'll come the generator will connect in down here and then the house panel will connect into here so we're gonna do this we were two inches off the back two and a half off the bottom and we're gonna check that before we drill it just to make sure the little m12 uh [Music] there we go thankfully it's aluminum so it moves through pretty easy all right all right [Music] uh i'm glad to get a washer for that but that'll hold it in place so the connection hole on the generator calls for inch and a quarter fitting over on the generator so that's what size we're going to run out of here as well that's going to be an inch and three quarter hole saw for that size hole it's like perfect size somewhere right in here underneath uh um i got a direct burial wire for the control wire and it's uh it's 18 gauge because it's what it calls for for size it's a 1810 sprinkler wire for like sprinkler pop-up sprinklers and such so it's rated for direct burial so i'm just going to sleeve it in the pipe same with my direct burial wire for the generator i got that as direct burial i'm going to sleeve it down here let it go over and sleeve it coming back up but both of them are ready for direct burial so it makes it a lot easier so i'm going to just pop this hole in for the half inch real quick right over here i think that way it's out of the way of the big wires coming in there we go [Music] well so much for the plan it's starting to rain we got the remnants of hurricane ida starting to roll in and man it got dark it is super dark and the rain's starting to fall and the wind's picking up it looks like we're fixing to be done for the night we'll have to continue this tomorrow last night was a total washout so we're going to see if we can get this knocked out this evening as the rains finally stopped it rained all day today and uh so i'm starting by heating up my pipe i like to heat my pipes up and bend them so that way it's a cleaner look and that way i can put everything up against the house so uh i got the offset bent for up here just going to get my offset down here which will be somewhere about right in here so i use a blue torch you can use a heat gun as well i just pinch the air supply off a little bit that way it doesn't burn the pipe so like a wet noodle i should do it this is gonna be for my box offset hooking the generator side up is pretty easy um i like to uh put a little heated bend in my pipe on this side so it's not just a straight piece of pipe um that way it don't want to twist and you can keep it straight um put the piece of pipe in sleeve it coming out of the ground where it's going to be getting hit by a weed eater or other physical damage um just leave it in pipe and then i'm going to use a female adapter all of this is inch and a quarter put the female adapter glued on then i'm going to convert to uh flex car flex i think the technical name is like liquid tight flexible non-metallic conduit whatever um and you're going to want to convert that to flex because it's equipment and it's going to be moving and vibrating and you're going to want to convert that to flex so it's not a hard pipe so that's going to come the locking that's going to come off that's going to get threaded in here with the rubber gasket we'll cut our flex to length and then we will 90 it into the generator right there for a nice clean connection and we're not going to need all of these conductors there's 10 in this cable and we need six so what we're going to do is we're going to hook up for t1 and one into the ground the 12 volt and the transfer so and then what we'll do is we'll copy whatever we hook up color wise on this side we will do the same thing over here so that way everything matches up in here and here so i ran out of daylight last night and uh had to postpone till today but give me a chance to get the proper piece that i needed because i wasn't paying too much attention i thought this was a half inch knockout it's actually a three-quarter inch knockout so i had to get a couple of three-quarter fittings from the hardware store and some three-quarter flex but we are back in business and we're gonna get this bad boy knocked out tonight so not everything i'm just going to tack these in place because i'm going to have to take them back off to the uh load connection place because otherwise i won't be able to get to this set screw behind the wire here these extra wires i don't want to get rid of them because should i ever have one of these go bad i'll have spare so i'm just going to wrap these around the main wire here at the bottom like so this here's going to require a pretty small screwdriver i'm kidding not that small this one here will work i'm going to use orange for the yellow with the black stripe when it comes time to hook up power for the first time you want to pull these fuses out i don't understand why maybe it's a surge i really don't know but any my experience has been any time that we leave the fuses in when i've hooked them up at work um there's one of those at least will get popped generally i think it's the n1 fuse that always gets popped so if you hook everything up then pop the fuses in it'll be a piece of cake otherwise it's not going to want to transfer correctly and start up correctly and all that good stuff well that's the transfer switch side that's got the the ground the neutral of course the two are bonded since this is going to be the first means of disconnect so those two are bonded uh this is where the generator is hooking to like so i'll take these back off to hook the load coming over to the main panel here um and then up here up top that is where the meter can wires are going to come and hook into of course with the neutral here the generator side is just as easy so we've got our ground lug neutral lug and two uh feeder lugs anytime you hook up anything electrical it's always good practice to hook your ground up first and then you're neutral which a lot of times in your house circuit says your path back and then your hot last just in case you're ever working something hot and don't know it you don't fry stuff and then taking it loose is the same way you always want to take your hots off first then you're neutral then your ground last that's your safety i'm in no way no way shape or form and expert in electrical i'll go ahead and put that out there right now i am an electrician a journeyman electrician but i do not know everything i do not know even close to everything and i know there are tons of people out there that know more than i do but i do like to help people as much as i can what little knowledge i do have because there was a time i didn't even know what romex was that was green that doesn't look nice so these guys just plug in there and that's all there is to it and these plugs will go right back in there just push that extra wire back i normally like making my wires nice and neat but in some cases it's about impossible but that's all there is to it well that's gonna about wrap it up for this time i gotta get a battery for it still and uh we just got our permits back uh yesterday and we're just waiting on the gas permit now so as soon as the gas company gets their permit they'll come and they'll hook the gas up to the generator and i'll go ahead and schedule to have the um meter can pull pull it rework this could probably take me about an hour hour and a half to get that done and then i have it inspected and then get our meter plugged back in so hopefully the power company is not busy that day and can come and do that pretty quick i think i'm going to wait until i do get gas hooked up just in case it takes them a little while i've got a way to keep power to the house so that we're not without ac for half a day or the family's not so yeah i think that's that's about it it is it was hot today but man it has cleared out and it is i mean it's a gorgeous evening i don't know if you can see behind me in here it's uh yeah no it's washed out but this it's a nice blue sky cloudy a little bit but very nice breeze you can definitely feel it fall is in the air so i'm excited it's my favorite time of year this fall so hopefully this uh helped somebody out if it did drop me a comment let me know and uh hit the like button if you don't mind and of course if you're not a subscriber we'd love to have you as a subscriber to the channel we do all kind of cool and crazy stuff family related and homestead and farming and a little bit everything so hope you all enjoy we'll see y'all next time"

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"VideoID": "485",

"Title": "How to install electrical wiring into ICF walls",

"URL": "https://www.youtube.com/watch?v=9P9\_AieEFEI",

"Keyword": "Electrical wiring installation",

"Transcript": "Hi I'm Micah Garrett with BuildBlock\nbuilding systems and today we're gonna show you how to mount electrical boxes.\nwe're gonna go over some of the tools and show you some of the tips and tricks\nto make this a fast and easy install. First you're going to need some\nelectrical boxes you might want to use plastic boxes one of the best styles to\nuse is one with a flange on the side or you might use metal boxes these are a\nstyle that you can mount directly to the concrete both are fine and effective\nit's just a matter of how you install them is is what you want to be able to\nfollow some of the tools to use to make this job go quickly and effectively are\na hot knife this allows you to cut the foam out really quickly easily and\neffectively you may also just want to use a basic handsaw\nthis can do everything that a hot knife can do also just takes a little bit more\ngrunt work you might also consider picking up an electric chainsaw you can\nfind these at your big-box store your do it best your lbm whatever it is this is\nabout a $50 purchase that will make your job go a lot faster so right here we're\ngonna be mounting a plastic box I'm gonna want to put this right next to\nwhere an actual web is and so here I've just kind of drawn out where this box is\ngoing to go I've measured this up the base of this box is sitting at about\nbetween 12 and 13 inches and then we'll cut up through this section right here\nthis we drew this a little bit too high so that's just a mistake this is where\nwe're gonna be cutting out the box this is a fairly inexpensive tool allows us\nto make simple cuts on this wall itself what I'm gonna make sure I do right here\nis I'm gonna cut right up next to this web so that the flange here will be able\nto mount right on that web just takes a second heat up and you see it's starting\nto get warm here this makes it real simple to just insert this knife in and\ncut down right where I've already marked and this is very fast and simple to cut\nthese boxes out I just want to make sure I get around\nall the corners here sometimes it's good to stick a little bit so now we've got\nthis cut out I can now take a simple lever here and pop this out you'll also\nnotice that occasionally here at the interconnect there's a little bit of\nconcrete that sticks out I can take a simple tool like this and be able to\nchip this out with a hammer and that'll allow me to mount the box a little bit\nmore flush here in the back if I need to so this box is now ready to be mounted\nso in this case we're gonna mount a metal box and I'm gonna cut this out\nusing a hot knife see that just goes right in there very easy to cut this out now if you don't have a hot knife you\ncan also use a basic handsaw this you can cut out just like you would anything\nelse make sure you get all the way to the back of the wall there you can see\nit doesn't take too much time to cut one of these off and I'm gonna grab a lever here loosen\nus up pull right on out and we're a touch tight we're just gonna\ntake out a little bit of this foam here on top so now that I have my box here I'm gonna\nbe cutting a chase to this box on either side so I want to knock out a couple of\nthese little pieces to make sure I can run my wire straight into it that'll\nmake it a little easier for the electrician later set my box in place\nand then what I'm going to do using a drill and a masonry bit I'm going to be\ndrilling a hole into the back I want to make sure that I'm nice and\nlevel here got the box right where I want it and now my box is nice and\nsecure so here I'm going to be taking an electric chainsaw to cut my electrical\nchases from box to box I'm going to be cutting right here at the interconnect\nbecause this is a place where there is no webs the chainsaw makes it quick and\neasy allowing me to cut this and go all the way across from box to box so now we have our chaise that is cut\nfrom electrical box to electrical box this is the place where I can now insert\nmy electrical wire and this conforms to the depth requirement required by most\nbuilding codes so I can take my wire and insert it directly back here put it back\nbehind here and then to secure it in place I can put a little drop of foam\nevery now and then to make sure that that wire isn't going to come out of\nplace and you can see this connects all the way across from box to box and ties\ninto the wall here where the wire can now come down"

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"VideoID": "486",

"Title": "Outdoor Electrical Project: Patio Wiring and Running Power to a Garden Shed",

"URL": "https://www.youtube.com/watch?v=pII22Elz0gE",

"Keyword": "Electrical wiring installation",

"Transcript": "well hello again do-it-yourselfers terry peterman the internet electrician and welcome to another video short on current topics here on youtube and of course at my website electrical dashonline.com in this video i've got a little project in the backyard here on my deck we had a about an eight foot covered deck that was 30 feet long so we got that covered in with a metal awning with a glass roof and of course then that left a need for some electrical work in it needed to get a couple lights out there or some kind of lighting a couple receptacles added i've got an entertainment center out there that i'm going to put in with the television you'll see that on one of my other videos showing the mounting of that but now was time for the electrical and also at this house we just purchased this spring we the shed the garden shed didn't have any electrical to it so i combined the project i added from an outdoor panel i added a run of pvc conduit through the entire outdoor deck area dropping off for some receptacles here and there i modified the lighting from the existing house circuit which i'll show you and i combined with the pvc as well then i carried that pvc onto the end of the patio drop down the wall underground and up into my shed where i wired the shed just as any open frame construction type of wiring method in there so without further ado let's get going and i'll just show you a few of the things i i did in this i couldn't give you every step of the way i have weather constraints here it's fall on vancouver island we only get it seems like about six hours a day light so yeah you got to work with that and the rain and the mud so i i can show you what i can let's uh have a look all right so here i am outside with the start of my project here for the patio area to get the outdoor electrical done on this outside wall which is now basically partially inside i'm standing right here in the middle of the mud it used to be a flower bed so again excuse the whole yard still in the middle of renovations and the yard is going to be the last thing and with the middle of muddy november on the island not likely to get done till spring but anyway so here is that outdoor panel i have there's two spots left on either side now this is wired for the hot tub but i wired 60 amp out here to feed this and then it's a 40 2 pole for my gfi for the hot tub itself so i've got two spots here on either side that i can run two other 15 amp circuits i'm gonna run one around the yard here for all yard lighting and some convenience outlets throughout the the backyard and the other one's going to be for this area underneath my covered patio which includes my television i've got uh i'm going to have a stereo out here and then on to the garden shed as again mentioned in the opening so here's how i did this now this is i used liquid tight flecks a short little piece here of liquid tight flecks that they use i use that more like an offset for this this fitting here because i couldn't find an offset half inch at the home depot where i was at and besides that i needed a little more of an offset bend so i just used one of these flexible pieces to start my run and then from here on everything's going to be straight and level so you can see i offset it down there's a little tip if uh never offset up because then that way your water does run on it it's going to try to migrate into your panel so offset that down so any rain that would fall on here this is a water tight connection or basically a water tight although it's going into a knockout on the side of this panel weatherproof panel this is a gasketed fitting so it should be watertight but nonetheless you want that water to if it's going to hit here flow downhill and drip off here so then all glued into pvc fittings going into an fsc box pvc this will be a receptacle my barbecue sitting right here so this will be for the rotisserie probably some extra lighting for it and then i 90 up and we'll go on from here and show you the rest of the conduit run which is almost done except for the little piece to go across to the shed which i i'll show you the progress and the completion of that getting power into my garden shed here that wasn't wired all right so we're going to have a little bit of a less steady camera shot here because i'm going to follow this conduit along so that first outlet i'll put there will be a gfi so i'll use a regular 15 amp breaker single pole all the stuff i have out here one circuit is plenty for it so it's just basically a convenience circuit with some receptacles and some lighting so follow that conduit up that'll be a gfi receptacle and then i'll feed on the load side of that all the rest of the stuff here so up past my outdoor light now using conduit on the outside of the building here i debated whether using cond pvc emt or wire mold but being i've got a dull gray vinyl siding on here the gray pvc kind of blended in and i think i'm going to end up doing something different on the outside of this house anyway and so when i do that i'm going to put all this wiring inside the walls so anyway now to be as less obtrusive as possible and less noticeable that conduit blends in fairly well so there it's running just underneath the eave all along that vinyl siding and then i'll show you what i got going behind the television so that conduit then went into an octagon box a four outlet octagon box which i used at that other bend as you noticed at the other end of this run then that's going to be a receptacle right there for the television right now i've got some temporary power just kind of run off of my outdoor light that used to be a patio door there that you see to the left of the television so there was an outdoor light switch and an outlet box that i've just got i got maretted off or spliced through hot and then that's where my power is now for the tv but i'm going to turn that back into a light later on so that we can turn on light from the bedroom and see if there's anything going on outside at night that we need to notice anyhow up top there is going to be the receptacle for the television and the digital tv box and then right here is going to be a switch to turn on the lights the the main lights underneath this awning which i'm using led tape light which i'll show you the results of that when it's finished tape light inside the i-beam the white eye beam of this awning so it really throws a nice soft light and then all the way down there to another outlet box this is where my stereo system is going to sit surround sound underneath the television and then as you can see we're going to carry on to the other side and show you where i'm going to feed that shed and there's my trench done and ready for the conduit to go across to the shed didn't quite get the 18 inches i would have liked to but we had rocks and roots in the way and besides that this is going to be capped off with concrete next week we'll be pouring the pad between the existing pad there you see on the regular patio pad and then over to the shed i'm going to pour that level with concrete so the main thing is mechanical protection for that conduit and wire that's why either go deep or you got to protect it and that concrete will be quite sufficient to protect that conduit and wire from any mechanical damage okay so i just had to measure from that pipe that i had turning the corner and going down to the other 90 i just put that elbow in the ground at the level i want it kind of marked it on the wall where it came to and then take into account into account the depth of your couplings the bell end of this conduit is about an inch and a half so that measurement came to 90 inches so just cut my pipe i use a reciprocating saw you can use a hacksaw and numerous other things you can use to cut it but i find a reciprocating saw is quick makes the job go nice and fast and then make sure you clean out your burrs there's none here of course and none here these are factory ends but after you've cut it you're going to have a rough edge there with burrs you can take a rag or some emery cloth or even just a leather glove and clean those out and then you should clean prime your conduit clean it for sure but some use a primer and some just use the pvc cement you don't need a lot of this but you do need enough to make sure that you're vulcanizing the plastic so the pvc so i just go round and round and round after it's all clean and then shove it into that bell end trying to work with one hand and film at the same time so shove it right in there all the way and twist at the same time and then slowly turn until you can't turn it anymore and you've got a nice joint there nice water tight glue job i'll just show you cutting i need to trim a little bit off of this piece of conduit about an inch so with my recip saw and there you can see pretty nice clean cut okay so there you see my pipe the 90s on ready to go across to the garden shed don't strap anything down yet because you need to be able to move things around until you get that proper length going over to the shed and up to the lb so just leave everything not strapped quite yet but before you cut that piece between the shed and the 90 make sure you're level coming down the wall of the house so just do that by measurement cut your piece and then make sure you're all good before you strap everything into place all right so i've got my conduit in place drilled hole sawed a hole for that lb to go in and now i'm just going to make sure this conduit is level coming down the wall and more important than level is lined up with what you're going to see it against and that's the siding itself so whether it's level or not you want to be parallel with that siding so right about there is good the way up hold that in place and measure my final piece between here 30 and a half between the two okay so now that that piece between is cut to the right length and checking my distance all the way down from that trim to the conduit it's perfectly parallel with that going down now into the ground three straps on that length now the last thing i'm going to do is glue that lb on put it into the wall and then strap that last two hole strap in to hold it against the side of the shed when i mentioned try to use the bell end of the conduits as much as you can it saves couplings but not that they're expensive just any fittings are kind of ugly so as few fittings as you can get away with the better in my in my humble opinion so we'll apply our cement let's called pvc cement of course i cleaned that first with the primer also when you're gluing these these last pieces together make sure you don't have any dirt inside the conduit it's a good idea before you're ready to glue to just put some tape around that so you don't get any dirt in there but i just checked to make sure i didn't have any dirt put my fitting on and then slowly turn it to a point that it's the right angle and there my lb fits i'll put a perfectly strap in here and this one i'm just gonna eyeball level coming out of the ground by the time the concrete's on here concrete's gonna be up to here so if it's not perfect you're not gonna notice it but i can get a pretty good eye shot on that okay with all my conduit run i can start pulling wire and put on devices so i'm ready to start pulling wire now my longest run is this one from behind the tv in that octagon box going all the way across the wall 90 degree bend down the wall underground and over to that lb as we showed you digging it in so that's the longest run i've got that's probably the only one i'm going to need a fish tape for so here's my fish tape all ready to go just a little one about a 40 footer 50 footer from mar so now i need to push that fish tape in through this hole in through the octagon and hopefully it comes out at the lb where i can hook some wires on to feed the shed and pull them back to here all right so this is a fairly straightforward procedure make sure your fish tape has got the proper hook on so it can't get caught should you not be able to get all the way through there and you got to pull it back or anytime you don't want a sharp edge on this fish tape i'll show you how to bend a hook on a fish tape in another video if they break because they do break once in a while but as you see here it's got no sharp edges i can run my hand along there and it won't catch on anything it'll pull right back out not catching on a coupling or anything else if you need to come back out with it and when you're pulling your wire in of course so in we go just a stiff spring steel fish tape a lot similar to a plumber's plumber's snake now when you're pushing the fish tape in make sure you don't catch like i just did i unspooled the fish tape first now i can feel that first 90. and that's the reason the code only allows up to 490s maximum total bends equaling 360 degrees so that would include any 45s all adding up so basically 490s or anything that adds up to that 360 degrees 390s is nice because you can push a tape through anything more than that like i say it gets gets tough so i feel that first one kind of wiggle and shake it buy it past that 90 it goes now in about 10 feet you should feel that other 90. there it is i can feel it getting stiff to push in so just kind of shake it don't try to just push it rattle it and it'll wiggle its way around that 90. here's the third one wiggle and push and go check at the lb and see if the tape is out and there it is zooming in on the other end and that lb as you can see the fishtape has emerged so now all i got to do is tie my wires on pull them back up to this octagon box now all i need here is a a black a white a hot neutral and a ground and then i can wire my shed using that feed all right so there you have it we pushed the fish tape in i hooked the wires onto the tape and then i brought out my faithful assistant sandy and we pulled those wires back into this octagon now we can continue pulling the wires we need down to the rest of the outlet boxes so with all my wires installed now i've got the devices in place in behind that box cover is the gfi that starts off the circuit and then i feed on the line or the load side i should say the rest of the circuit here underneath my awning outdoors so following this along there's the start like i said the gfi receptacle moving on up to that octagon box and as we showed you before underneath the eve another octagon box and coming down to my receptacle now it's going to be for the television and down to the switch for the lights and another receptacle down low which will be for my stereo system so you may ask why these aren't weatherproof covered plates on these that's because they don't need to be i'm well underneath cover here so out of the weather i did put a receptacle weatherproof cover plate on the gfi to start the run just because there's a chance that with the wind the rain could come in sideways and get on that receptacle carrying on here out from behind the television and coming down and across into the shed now in the shed here i just came up to that receptacle i cut into the wall there and i put a weatherproof cover on it because now we're basically out in the open under the eve a little bit but we needed a weatherproof cover there and inside i just wired the shed with another receptacle a switch and i'll show you that inside okay inside the shed now just wood construction wood studs osb plywood on the outside for now that's where the wire comes in through that lb and then i just ran a two wire up to that outlet box for the outside plug and now i'm going to just talk about the wiring i didn't show much of the wiring other than pulling in this first run but what i did here i used lumex or romex and i started i fed it in from this end but i stripped the wire this strip the jacket off of the cable to pull it in just as single conductors that's what the code asks you to do when you're using romex if you're going to bury it and conduit they want the jacket the external jacket removed so i removed enough of the external jacket that from once it's inside that lb it's just single conductor wires and pulling in through the conduit but i wanted to leave the romex jacket on it at this end so that i can just wire this shed as per normal and using romex run through wood studs here and we'll probably cover up insulating and finishing inside the shed down the road but for now it's just wired with romex or lumex and as i said strip those conductors to feed all the way into that first junction point that was above the television so then into that outside outlet box it's of course protected by gfi as is everything on this outdoor circuit and then through the studs over to another outlet just inside the door just a convenience receptacle in here and then i came up out of it into a switch and out of the switch i used a three wire now and followed it up drilled it through the roof trusses here and i went to a receptacle box with my three wire and i put a split receptacle in here one half of that receptacle is switched and the other hot all the time and then i went out of it and i also just put a regular octagon box in here for a future light so the reason i did this is because i bought a fixture here that's an led work light workbench fixture it's got a plug in on it as you can see and so this fixture doesn't really even need a switch it's got a remote control for it and it's motion sensor you can control the time it takes that you want to leave it on it dims when there's no motion and then it'll go off or multiple settings you can use and control it all by this remote control so all it really needs is power all the time so right now i've got that fixture just plugged in up there but i did want to wire it so that if we needed a regular fixture that could be put into place in that octagon box or you could hang another regular fluorescent or a led i'd never use anything but led anymore but you could plug it in up there and have it on the switch as well or hardwired into the octagon box just left myself all kinds of options here there's that octagon box for a regular light fixture if someone wants that down the road but for now as soon as i open that door this light comes on so as a side note to the wiring i had to install in the conduit everything was pretty straightforward one hot one neutral one ground to everything for my receptacles but here's what i did with the switching for the lighting out here this is a three-way switch and over here as an afterthought to my original conduit run i decided i should put a switch box in this run a conduit here too so i cut that box into my run it's a regular fsc box as well but what i did is i'm going to use i'm using this outdoor light here and then i also ran power from that outdoor light into another box where i've mounted a transformer for led strip lighting so the low voltage as you see comes out of that flex flexible conduit ran it through the structure and what i'm going to show you is my tape lighting which is tucked in behind that beam so you can't see it but when i turn that on it lights up that whole beam the full length of the awning here and gives me a great light so i just ran that low voltage through weatherproof conduit and as you can see there the low voltage came out of the end of that tubing and it just terminates there in the in the lvt low voltage wire just runs over here and i've got it spliced to the power for the tape light so back to the story on these switches everything out here is on that one circuit that comes from my weatherproof panel here but the lighting now is actually on a different circuit i cut in that box and what i did is i drilled out through the back of it and put a connector on and then i ran three wire through the back of this box and into my three-way switch that's inside the house so i use the existing house circuit all it was is power in and power out to that light fixture that you see on the outside of the wall so what i did is i added a four-way switch network to this so taking the power from inside the house and inside that three-way switch box ran out to here and through the conduit all the way to the other three-way switch which is way over here and out of that three-way switch then the two travelers come back through my conduit and into this is an actual four-way switch so i got two travelers in two travelers out and then back inside the house to the three-way switch and the common goes in through the wall as it was up to that light so a little confusing there but what i did is i just used my conduit system to make a four-way switch network three-way inside so if you wanted to you could turn the lights on out here without opening the door kind of redundant to have a three-way inside and a four-way just outside but if you're out here if you wanted to turn the lights on you'd have to go inside to do it but now i can turn everything on from here or inside or over by the television there and here's the shot of what those led tape lights look inside that beam and that shines lights up that beam the whole way down the awning here's a three-way switch from inside the house that originally was a single pole just power in and power out to that light but just adding that four-way network to it so this is now a three-way it also turns on those outside tape lights so that kind of wraps up the outdoor wiring and using pvc conduit and the power feed to my shed video that i showed you thanks for watching i just wanted to show you point out a couple things the hot tub is sitting here this is where i mentioned in the video that my entertainment center is going to go and you're probably wondering why the hot tub is so close to the wall and that switch which is gfi protected but really i'm going to probably put a waterproof cover on here weather tight cover anyhow the hot tub is not staying exactly right here i struggled with deciding to have this tub underneath cover which i do have a glass ceiling in here which is nice to see the stars on the moon at night or outside in the open air which we prefer actually and i couldn't decide where to put it maybe inside maybe outside halfway as you can see in the background here we've got it all formed up and ready to pour concrete tomorrow so this is going to be a 16 foot wide pad instead of only eight feet so what i came up with is a solution i built the tub i built a deck a very sturdy deck with eight heavy duty casters underneath it and then i fed my hot tub with liquid tight flex and enough cable that it can go in and out so what i can do is wheel it in here under the deck it'll never be this tight to the wall it'll be out quite a ways here but as you can see it rolls quite easily and when the pad is done on a nice summer night you can just roll the tub right out onto the new patio in the open so thanks again for watching terry peterman the internet electrician please like this video and subscribe to my channel leave me a comment and i try to interact with as many comments as i can hit that notification bell so that way you'll know when i release a new video again thanks terry peterman the internet electrician until next time"

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"VideoID": "487",

"Title": "How to Install an Outlet From a Junction Box - Electrical Wiring",

"URL": "https://www.youtube.com/watch?v=Syn32MkFBg0",

"Keyword": "Electrical wiring installation",

"Transcript": "electrical wiring is certainly not the easiest \ntask but with the right set of tools and safety   precautions one can wire a variety of switches \nand outlets with the proper knowledge today I   want to cover an example I've had a wire \nand outlet from a junction box hey it's   William here I hope you're having a great \nday and welcome back to shop fix a community   joined together for the love of woodworking \nlet's go ahead and get this wiring started I'm currently renovating the living room and \nI need an outlet installed for a built in desk   that I am building first you'll want to plan \nthe location of the outlet box I'm working with   a one-gang old work box which will need to be \npositioned between the wall studs after making   sure the outlet box was leveled I traced out its \nposition and then proceeded to cut out the drywall   along the lines I just drew after test-fitting the \nbox it was time to bring power to that lee since   there was no wiring anywhere near the new outlet \nI had to branch off from the existing 15 amp line   via a junction box this junction box was located \nin the basement just below the desk so after   marking the location of the floor stud I was able \nto drill a small hole from the basement as to feed   the wire up to the existing wall prior to drilling \nthis hole it's important to ensure that you can   actually drill such a hole in the location you \nhave chosen and that no prior electrical wiring   is in the way after the holes been drilled you \ncan feed your wire through for a standard 15-amp   outlet you'll use 14 gauge wire as I am here after \nfeeding the wire through you can use the hole that   you previously cut out the drywall to reach in and \npull it all the way through the drywall be sure to   leave an ample amount of wire on the outside of \nthe wall although you only be needing six inches   in the box leaving extra gives you a bit of wiggle \nroom now you'll want to take the rest of the wire   and route it to your closest junction box there \nare standard rules for holes that can be drilled   in floor joist that you can look up if needed I \nsimply used the holes that were already drilled   another important thing to note when deciding \nto route wire to a junction box is deciding if   that specific junction box has enough cubic inches \nleft in the box to house a new wire you can look   this up online and determine if you have enough \nroom and I'll leave it link in the description   below after securing the wire to the floor joist \nit's time to turn off the power to the line via   your breaker box if you do not know exactly which \nbreaker it is wired to simply shut off the master   breaker open up the junction box now and feed \nsix inches of wire into the box you will need to   unsheath the portion of wire that will be housed \nin the junction box I want to thank you for tuning   in to this episode of shop fix if you have found \nthis video helpful please click that like button   and consider subscribing today let's continue by \ntaking wire strippers to expose about a half inch   of bare wire which will be used to connect to \nthe corresponding wires inside the junction box   obviously you will need to wire the junction box \naccording to your specific situation in my case   I simply needed to connect white to white black \nblack and ground to ground with proper wire nuts once the proper connections are made push the wire \nback into the junction box and seal it up be sure   to connect the ground wire to the junction box if \nyou're using a metal-style box at this point I can   head back upstairs to finish the wiring make sure \nthe power is still shut off with this line as you   can see I'm finishing this wall with pine boards \nand I needed a frame this lumber around the outlet   box afterward we can unsheathe six inches of wire \nwhich will be housed inside of this new work box you can then take wire strippers to expose \na little more than half an inch of bare   wire and which will be used to loop around the \nterminals of the outlet make sure you loop the   wire in the same direction as the terminal \nscrew tightens so that the wire doesn't get   pushed out as you tighten the screw down \nthe white wire if the wire is, in fact,   neutral should be connected to the neutral \nterminal on the outlet which is oftentimes   a silver or grey screw the ground will be attached \nto the ground terminal usually green and the black   wire assuming it's hot should be connected to \nthe hot terminal which is usually copper-colored   after tightening the outlet to the box you can \nattach your outlet cover to finish it all up"

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"VideoID": "490",

"Title": "3 phase house wiring | 3 phase home wiring | electrical technologies",

"URL": "https://www.youtube.com/watch?v=Ut\_PKHrrug8",

"Keyword": "Electrical wiring installation",

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"VideoID": "491",

"Title": "Cooker socket connection-Electrical cooker wiring diagram- how to connect the electric cooker",

"URL": "https://www.youtube.com/watch?v=L0xj3jTqtaI",

"Keyword": "Electrical wiring installation",

"Transcript": "foreign [Music] [Applause] how to connect it [Music] a cooker socket is just an easy means of switching the appliance off in case of emergency and it's therefore normally installed in an accessible location within a set distance from the appliance why does a cooker socket have two switches single switches can only energize the live wire but cookers draw so much power that they can energize even the neutral wire double pole switches on the other hand shut both wires off for complete safety"

},

{

"VideoID": "492",

"Title": "How to Use Wiring Diagrams For Car Electrical Diagnosis and Repair",

"URL": "https://www.youtube.com/watch?v=mEJEHxlbn9o",

"Keyword": "Electrical wiring installation",

"Transcript": "hello and welcome to the car Cara Channel and welcome to part two of the electrical Series today we're going to be talking about diagrams wiring diagrams for cars how do you read wiring diagram for cars I cannot tell you how many times see technicians they have an electrical problem and the first thing they do is start working on the car that's actually a mistake wherever you're dealing with anything electrical the first step is you need to pull the wiring diagram for the system that you're working on and understand how it works because even if you are an experienced technician you need to understand how this system is wired so you can actually effectively diagnose it and understand where everything is going and what's going on and that starts with the wiring diagrams and that's what we're going to focus on in this video I'll show you an example and you can apply that basically to anything and this is how your thought process should be having said that let's get started let's take a look at this wiring diagram we talked in part one if you haven't seen that I'll leave it in the description we talked about the horn circuit usually being the simplest diagram you will look and the simplest system you will look at this is the horn circuit from a 2012 Toyota Camry the wiring diagrams we are using are Toyota diagrams my channel this channel is focused on Toyota luxus however this information you will you can use it on other manufacturers they will have similar diagrams now Toyota do have some of the better diagrams they're color they're really intuitive in the past they used to be more complicated but now they've gotten really good and they seem to be the better diagrams out there in my opinion complication wise so let's start by looking at this simple circuit you notice at the top says battery that means this component is powered directly by the battery sometimes it'll say if it says IGN that means means this component is only powered when the ignition is on but in this case it's constantly powered as long as there's battery power from there it goes to the fuse 10 amp horn fuse very simple from there we have a wire going out and splitting into two that same wire splits into two and feeds the relay in this video we're also going to talk about relays and how they work so we get how that works from there we have two branches one of them goes to the horns themselves and one of them goes to the switch so here is something about electrical system in cars you are always switching the ground on and off but equally if you can't do that or you want to separate the circuits because you have a switch somewhere I mean we look at the diagram it's all in one page but in reality this is the steering wheel this is the front of the car this relays in the fuse block under the hood and this fuse is all there also so these components are not right next to each other so how do you control a high current circuit remember we talked about amperage a high amp circuit with a low amperage switch because if you amperage creates Sparks I told you amperage is what burns things what fries things if you put a very small switch a delicate switch to power a high amperage circuit like in this case 10 amps up to 10 amps when you activate the switch the tip of the switch will actually burn very quickly and very prematurely and now we have problems but how do you control a high amperage circuit with a very delicate small switch like the one that sits on the steering wheel when you press the horn pad you do that with relays let's talk about relays for a little bit we will depart from the wiring diagrams so this will start to make sense relays let's draw a relay here and let's explain how this works now relays there are many types let's focus on the most basic one they usually have four prongs now the prongs are usually on the same side in the actual relay but for demonstration purposes here we're going to draw it like this let's say we have a component this component is the high amp component that we want to to turn on and off with a very small delicate switch now this is grounded right here so we need to supply power to this compon component well the switch the tiny little low amperage switch is right here and this connects to 12 volts so we have power here and then we want to power this guy this switch if you connect it directly to this guy you'll activate it two three times the switch will burn because there's too much amperage passing through it so here's how relays work and I'm going to draw this upside down so bear with me here now to power this High amperage component we need 12 volts CU we already have ground to it so let's say our 12vt is right here that's the source of 12 volts we're going to connect it to one of the prongs of the relay and then we're going to connect our high amperage load to the other prong of this relay right here how do we switch it on and off well let's say we have a ground here relays will have an arm let's say this is the prong they will have an arm right here the arm is not touching that prong and on the other side they will have a coil when you energize this coil it creates a magnetic field this magnetic field pulls this arm to close it and make contact this is a very delicate coil that doesn't consume a lot of amperage I mean it barely uses anything but this prong is a big strong wire that is capable of carrying that high amperage so when I flip my little tiny switch all this switch is going to do is power this mini coil here this coil however is going to generate a magnetic field strong enough to close my relay contact and now this 12 volts and this wire that is capable of carrying High amperage will make its way here and it's going to power my component this is the most basic form of relay there are a lot more different relays and we're going to make a full dedicated video on relays we talk about all the different kinds and how they work but this is the most basic relay which takes us back to our horn circuit now you notice here from the horn fuse we have the wire coming down this is a 12vt this is a battery and it splits into two and this is a normal thing to do because I can basically take this 12 source and connect it here this is a low amperage setup you can get power to this from anywhere it's not a big deal so what they do here is they split the same wire into two and then the coil side you see they even write it as a coil inside the relay that's why I told you Toyota diagrams are good they write the internal stuff most of the time that wire goes down and splits into two areas and this is where diagram confusions start wait why do I have two switches see when they draw wiring diagrams they put all possible configurations in the same page because they're not going to make oh there's a diagram for the Le for the SE for the xse for the one that has this steering wheel and for the one that has cruise control one that doesn't one that goes to different markets in the world and the one that goes to the US and can't they're not going to do that cuz sometimes there are differences they're going to put everything in the same diagram then they're going to give you the guide in this case there are two switches one of them is there's a star one and one of them is star two if we go to our guide here star one it says with steering pad switch assembly star two without steering pad switch assembly I don't remember the last 12 Camry that did not have without steering pad switch assembly it will have to be an L model which is below base level so we're going to go with number one number one goes right here but then inside the switch there are two more options you could could either have a blue wire or a very small non-colored wire we have option five and six five and six are with paddle shifters or without paddle shifter models are the SE non- paddle shifter models are all of them this is where product knowledge comes in hand then you have a switch that switch is connected to ground see how that works so we are ground switching it we're ground switching the relay so when I connect this ground it's actually going to send power to the relay powering it pulling the prong and now we have power flowing to the horn but the important details here are not really just how the circuit is Flowing we're using that for diagnosis but I want you to understand beyond that every time you have a box that's a component or some kind of subassembly in this case this box right here it says right next to it spiral cable that's toy language for clock spring so this connection Point happens inside of a component which is a clock spring and then this second component is a steering pad switch assembly which is inside the steering wheel itself you see how these are two components and then when we look here the relay it also is a box with a color that is a component then we go up top the fuse is also in a box with color that is a component and we're going to look at a few other diagrams in this video and you'll see where this gets a little bit more complicated but then we go here when you power this relay this prong is going to come in we're going to power our two horns the horns you notice that they are grounded to the body we're going to send power to them they're going to come on there's the low and the high usually hor there's two so this is now we understand stand wait if my horns are not working am I getting power to them when I hit the the steering pad if no we're going to trace the power back do I have power going into the relay from the high amp side yes that means this fuse is good and this wire is good so now let's check do I have a ground here when I press the switch if you don't then perhaps we have a problem on this side of the circuit there is no point at that point to go check the wires M them and flip the relay or swap the relay there's no point you have no signal to the relay but if you have 12 volts at the Top If you put 12 volts here the horns work this switch is supplying ground when you press it and I have 12 volts at the top the only thing left in this case is the relay the relay is not doing what it's supposed to simple diagnosis if you have everything working but the horns are not working you have 12 volts at the horns when you press the button your ground is bad on the horns or if the ground is good on the horns the horns themselves are no good you see how this we couldn't have arrived at that conclusion without understanding how the system is laid out that's very important and something about diagrams this is Toyota specific every component except relays and fuses will have some kind of a number or identification next to it that identifies the connector for that component and then on the second page they'll actually show you the connector but more importantly than that right next to each component connection Point they'll show you a number that is the PIN number so let's take an example here the spiral cable I want to find my wire let's say that wire is broken and I want to find it pin it and test it it says connector B we look at the diagram the guide here next to it connector i28 is connector B pin n so I'm going to move to the side where is i28 i28 is right here actually tell you this is a black colored connector pin 9 is right there now I know exactly which wire to check on the car this is how you cross between these two otherwise you're looking at a needle in a Hy stack you have to know which pin exactly to look at and this is what the diagram tells you now let's take a look at a different circuit this is again from 2012 Toyota Camry with no smart key the smart key things get a lot more complicated and we haven't gotten there yet so the starting circuit the first component is going to be your ignition switch this is what you turn and that's what starts the car this is only the starting circuit not the accessory or ignition on you see this switch has two prongs one of them is am1 one of them is am2 these two switches are connected to two fuses this fuse is am1 it's 7.5 amp fuse fuse you notice it's a lot smaller cuz this Powers the control side the other fuse is a much larger fuse it's actually not a fuse if you see this symbol this is a fusible link not a fuse it's a 30 amp starter am2 this is the big guy that actually turns the starter so from these two wires we go to the switch switch is is a toggle when you turn the key these toggles connect and send power out now from here let's start chasing our high amperage wire first so we understand how this is wired this High amperage wire goes down to the prong of the relay the high amp prong side of the relay which happens to be just so I would left this here so you can see it which is this one so now we have power here from that it goes out this side straight to the starter and starters work in a very unique Quay and we'll talk about that in a second that's the high amp side let's talk about the low amp side which is the other prong which has the 7.5 amp fuse from here it goes out and down and splits into two and the reason for this to split and this is where a slight complication comes you have the neutral safety switch this is very simple basically if you're not in park or neutral the car will not start and the reason for that is you interrupt Ed this signal to the control side of the relay which is right here the other one though is ECM which is engine control module that can byass the park neutral safety switch it can actually connect the circuit and start the car bypassing the neutral safety switch that is why they wire the computer in it but let's simp simplify let's forget about the ECM for a second let's talk about Park neutral safety switch we need power to this little prong which is this one we need power here so this would activate the ground you see it right here goes straight to ground on the control side of the relay so we're going to follow our wire it's actually going to go through the neutral safety switch up and back into the ignition switch where it gets it 7 .5 amps pretty simple circuit let's talk about the starter briefly and then we'll do a quick kind of diagnosis scenario using this diagram starters are probably the highest amperage component in the car I mean you will need a giant very high amperage fuse to do that so what car manufacturers did instead of just having this giant fuse that will constantly be blowing because when the car is cold the starter will work a lot harder than the car is hot so they did a solenoid so when you activate the side this side of the starter a little mechanical kind of relay will move it will connect and what it will connect is direct power from the battery unfused and this is the why the power wire on the starter is prob possibly the most dangerous one because it is unfused it goes straight right from the battery you ground that wire we're going to have fireworks that's bottom line there's no other way around it but the high amperage side is that solenoid that moves and engages the mechanical connection to make that connection straight to the battery and it also moves the starter forward to engage it into the flywheel or the flex disc having known that about the starter let's talk about a diagnosis scenario using this diagram cust States car does not crank okay in any electrical diagnosis the first thing you do is check your fuses I see people jump into kind of very complicated components before they check their Basics do you have power here and do you have power here this is the first thing you check if you have power here is that power making its way to my first component in this case because this component is hard to access you have to pull the covers you have to do so this is where you stop your approach and say okay I checked the very Basics which are fuses the simplest thing to check I'm going to go to the next accessible component to see where we're at the starter is the next accessible component it's a lot less better accessible than your ignition switch on or your neutral safety switch you go to the starter We have basically two wires modern starters will still have two wires one of them is the big wire that comes straight from the starter you check voltage there is that wire fried is it a b contact is something going on you have 12 volts there great then you pull the second wire which is usually call the S wire or the control wire for the re for the starter usually a smaller wire than the big 12vt wire you check voltage there while you're cranking the car if you have voltage there all the components before it are good because that means the control side of the relay this side is doing what it's supposed to do it's pulling the prong it is sending voltage and it's making its way to the end of that wire at that point we're going to do a quick ground check on the starter which is basically the body if the ground is good the starter is bad the end but now we have verified that 100% but let's say this is too simple you don't have 12 volts here at this point you need to stop don't go chasing random wires stop and return to your diagram so you can draw an action plan you want to determine on your relay we're going to split this relay in half in our minds this is the control side and this is the high amperage side where is my problem is it in the control side or is it in the high amperage side that is the first that is very important that you distinguish where your problem is so the next thing usually I tackle and this is just a recommendation it's up to you is the relay the relay is actually easy to pull out you pull the relay and you start with a control side because majority of the problems are control side believe it or not because there is not really a lot of real estate on the supply side I mean you got the switch fuse and this but on the control side you have the switch the fuse the neutral safety switch and this and the ground you just have more stuff so you start with your control side am I getting 12 volts going into the relay control side like let's say this one right here or in this case it would be this one right here am I getting 12 volts there when I try to crank the engine if you don't stop right there your problem is control side there is no point for me at this point going to do anything with the high amperage side unless I figure out what's going on with my control side so we move to the next step we checked the fuses that was the first thing fuses are good but is this power making it past component that's the easiest way to check components by the way power goes in to say a switch power goes in power goes out when you activate the switch isn't that happening you go check here I have 12 volts going into the switch I turn the switch to the start position I have 12 volts coming out this switch is good it's doing what it's supposed to do we're done next component neutral safety switch neutral safety switch super simple to diagnose because all it does is just it's a switch that moves with the transmission when you're in park it makes contact when you're in neutral it makes contact any other transmission position it's open circuit that's all it is put it in park do I have continuity across it or better yet easier put it in park check that you have power making its way to that component you have 12 volts going in is there a 12vt going out no okay put it in neutral lo and behold you have 12 volts going out now at this point you found your issue but a quick verification and it's really nice when you can verify this you can actually put the car neutral and try to start it voila it starts we have a bad Park neutral safety switch we're done 100% you you're not going to be part cannoning this car you know exactly what happened but let's say you check the control side and it's all good I have power making it to the control side the ground is good I hear the relay clicking but the car still doesn't start H this point you're going to switch your diagnosis to the control side because we have a problem there the first thing you want to do is check your relay is is there power making it out of the relay so if this energizes it's pulling this prong but is this prong actually making contact do we have power coming out of the relay let's say we do you checked here at the relay you have power coming through it we're good right but then this is where diagrams get interesting CU if we look right here there is a junction connector these Junction connectors are used for assembly you can't have one continuous wiring harness for the whole car this will make assembly impossible so they section out wiring harnesses in the car so you can connect kind of connect them together in pieces and this is what this is it says ea1 we look at our little handy chart here ea1 is going to be this one right here and it's a two pin Junction connector basically two two wiring harnesses joining together with that Junction connector we're going to go to it do I have power going into this Junction connector because at this point this wire going to the starter became two wires going to the starter two sections we know we're not getting voltage here cuz otherwise the starter would work and we of course checked that because we said this was the easiest thing to get to I go to that Junction connector I have a red wire see in the color print by the way wires are labeled by by a letter next to them that's what it means when you have like for example in the ground w-b that means white wire with a black Tracer that's what that means there's a little chart for colors every manufacturer will be different for the color I go to the junction connector on the red wire I have 12 volts on the black wire I have 12 volts that tells me that my Junction connector is good there's no corrosion there's no issues nothing is broken in that Junction connector at that point here is the logic of diagnosis I have power at this Junction connector I have no power at the end of this wire this wire is broken at this point you're just going to chase it down the car find where your broken pieces or if you don't find it it's internally broken there's something wrong run a new wire quick jumper wire just to test that everything is good now you need to dig into the wire harness and find where it's broken very simple if you have no power at the red wire same thing this red wire is the problem but there's no point in testing the whole thing anymore you have arrived at the point of the brake if you have 12 volts here your problem is past the junction connector if you don't have 12 volts here your problem is between the relay and the junction connector Case Closed we're not going to go start our diagnosis by replacing the starter we're not going to start our diagnosis by replacing the park neutral safety switch or the ignition switch that's a parts Cannon you do your diagnosis but how did you do that diagnosis and draw these conclusions if you cannot look at the wiring diagram and understand what it's doing that is the number one thing you do when you do electrical diagnosis in cars look at the wiring diagram get familiar with how this works draw an action plan before you even go to the car before you start ripping things and changing and checking what are you checking you have to know this this is why wiring diagrams are super important folks and I hope this video now gives you a better idea of how to look at wiron diagrams look we're not trying to re-engineer the car and understand how the space shuttle works we just need to do our diagnosis effectively and this is how you do it folks I hope this video was helpful informative I hope you learn something new if you like it consider giving it a thumbs up if you're not a subscriber subscribe to the channel check out some of my other videos until the next video folks may the Lord bless you and keep you and you have yourself a wonderful day"

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"VideoID": "493",

"Title": "30 Amp RV Outlet Install. How to DIY Electrical Receptacle Wiring for RV. RV Plug",

"URL": "https://www.youtube.com/watch?v=4Xq8dddqxw8",

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"Transcript": "hey guys welcome back to my channel this is daniel with the kind electric today we are going to look at an rv plug that needs to be uh installed a customer wanted it um i'll show you what needs to be done i'll walk you through the process it's not a complicated process but there's a few things that you need to know so let's get started um but before we do remember to subscribe hit the notification bell and leave me a comment all right let's go all right just like every panel uh usually they do have a knockout on the bottom so what i'm doing here i'm trying to remove that knockout it's not uh sometimes it's not easy but uh it's uh it's possible just a little bit of dedication and the right tools and you should be able to break them out now if you don't uh if if you can break them out uh there's there's different methods but in this case uh that thing that just came out no problem all right then i'm trying to um fit the um connector everything is going good we're gonna put it on the uh conduit it's a metal flexible conduit it's called liquid metallic liquid tight and then we want to put the nut inside there so that is our next step to install the nut uh put the connector inside the uh the hole there so it stays we don't need to deal with that because the connector is a two piece all right and now we're gonna try to uh see how long the flexible needs to be cut we're gonna attach a little bit the content on the connector right there i'm to get the box get a rough measurement to see how much we need we're going to set the box on the wall and then we're going to measure a little bit just to see how much fun we need we're going to cut it with the flex sorry we're going to cut it with the grinder and uh the reason why i'm using the grinder is because there's that metal inside also at the edges we are cleaning the rubber outside because the nut that needs to be put on the connector um it's a little tight so we have to clean that out it's not uh it's not a big deal but it sometimes it it does go in without cleaning that up but it's much easier process to get that get that going in and then we're going to put that seal the yellow seal then the part the connector that attaches to the other side and then we're going to tie this down with the uh with the channel lock all right we have the wires i have a 10 gauge wire that's going to go into the tube probably have a hard time pushing that inside so i believe i'm going to take that out it's easier to push the wire if you don't have it attached to the connector and then here i'm gonna try to push it out with the screwdriver it's stubborn but it's coming out all right so the wire is out i'm gonna push it through the connector inside the panel now i have to bend a little bit so i can take it out of the connector and then uh run it just below those existing wires it's not hard but uh it should be able to come out and then i have some left over at the other end to connect the outlet the rv outlet all right i'm going to push as much as i need into the panel because the connection onto the brake that's going to be up above all the other breakers so um i need quite a bit in that panel i want to tighten that nut down keep the flex uh the conduit in in place tied the uh neutral and the grounding in there now obviously they can go on the same bus uh this is a mini panel not a sub panel if you have a sub panel you have to separate the ground and the neutral now some some would say you're not supposed to put the neutral in the ground together and put them on a separate screw i don't have a separate screw i don't have a another space in there so going together it's not going to affect it it does the same thing it's on different screw or not it does the same thing in here we're going to slide in the box and then tighten that nut on the on the box a little bit so we can uh place the box on the wall make it level nice and neat now we do have these uh big siding that go they go horizontal what i'm gonna have to do is i'm gonna have to uh put the box right underneath that siding i'm using inch and a half i believe two inch i'm sorry two inch lag screws just to hold it in place i believe i put four four of them there get the level give the box level and then uh the first screw that i'm going to use i'm just going to put it in to be able to get the box level now stays in place i like it the conduit is going to go parallel with the other with the other conduit good get that box level and they want to put some more screws in there right we got all the screws in there now what we're going to do is we are going to strap the conduit on the wall i'm using three quarter inch straps one whole straps i'm using the same screws make sure the the conduits are parallel looking good here's the lag screws and have a 5 16 head on that drill nice and secure all right we're going to do another strap all right we have us wood siding there so that's that's really easy to put in those screws and we're going to tie that knife down a little bit better to seal that inside so the water doesn't go in now we got that down set the camera in a different angle so it doesn't move anymore we're gonna cut the wires and you want to put some connectors on the end because the screws on the outlet are the way they're done it requires the the um the yellow connectors that we're going to crimp on the wires i believe they're called fork connectors if i'm not mistaken i'm going to crimp them down make sure we have a good contact do a really good crimp on those and then we shouldn't have any issues with the contactor and then the reason why i'm using those connectors is because we have stranded wire [Music] another connector on the wire cut the grounding and then connect the uh connect the wires onto the outlet there's only two screws usually it doesn't matter but in this case we used the black wire on the right side we we added the black wire on the right side and the yy on the left side just like a normal outlet and then in this case right here we are connecting the grounding wire that comes from the panel onto the box all right the next step is to install the plate that can that contains the outlet so the plate goes inside those two notches and then there's a screw that holds the whole plate onto the box and it's a really secure connection not a problem with that now we're gonna reroute the wire to go all the way up on top of the other breakers you have to be careful always those bus bars are hot unless you like to turn off the power in this case we don't have to because the house is running and there's only one breaker but i do recommend cutting the power off by shutting the main breaker the wire goes inside the breaker there's only one hole on the breaker if you have a 120 these are zinsco breakers they're not the greatest uh tools in the shed but uh we have to use them since the breaker panel is an old zensco breaker so we have to use them they still sell them they have new ones that you can buy and then all the all you have to just connect the right side and then snap them onto the bus bar and then turn on the breaker this way you should have 120 volts going down and 30 amps that's going to run your rv without a problem these rvs they can be found at home depot or probably even amazon but i bought this one at home depot and you can tell we have 120 volts all right guys this is it that's the process on how you install or how we installed a a plug for the rv like i said it's not it's not hard it takes a while to take me about an hour and a half to do all that process but it came out really great the customer is pleased and then we'll keep doing this kind of stuff until all the houses are connected all right thanks guys for watching we'll see you in the next one bye"

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"VideoID": "494",

"Title": "Summer House Wiring | Electrical Life !",

"URL": "https://www.youtube.com/watch?v=stQpNIZlhxA",

"Keyword": "Electrical wiring installation",

"Transcript": "yo welcome back to the channel we're planning on making a video about this but i'll do it anyway why not anyway yeah so someone else kind of thing as you can see i thought you started it yesterday so i'm just going to finish it off today show you some little bits and bobs that we're doing i'll spin the camera around and uh show you where we're up to what i've got left to do go from there so starting with the consumer unit or whatever i call it we've got the conduit running out trying to keep the conduit to a minimum are hidden we've got a light here above the bar every now and again we've got them fire clips even though i'm not sure even counts in this structure it's just a wooden structure it's not the way they know anything like that come down over here down for the light switch is going to be a three gang switch we've got a foot light out there and we've got a light either side of the door uh either side of the yeah sorry besides the door and then we go up there on the other side to them three lights there we're then using the same tube come round to a socket there for a dart board which has got a plug-in light on it when the door opens it covers that socket obviously you won't want to be retrieving a dart that's been stuck straight into the software and then from that we'll just go down to an outside socket there and then the rest of it's all on the back wall so we've got a couple of sockets there a spur for a heater and a couple of sockets going here i'm gonna do all that in black conduit on the back wall and just come rear entry yeah so i'm just going to do that all in the background come rear entry just to try and keep it to as much of a minimum as possible i'll show you the outside of it now quite either side and then a phillips philips floodlight though the pir microwave sensor comes with a remote as well all right so around the back we've got a 10 mil um that comes from the main house up that way obviously there's not much space around there so it's not the knee is going to reach very far that comes up whisker box straight into the back and then i've got me reducer there i'm going to 20 mil tube down and do all the sockets down the back that way there's less on show no one's really ever going to see it these are the screws i use for cleats the round head screws because they're big enough to not go in break the cleats that's quite common and then the armored runs right around the back of all them bushes it's a long run 40 40 odd meters i think it was which is why it's 10 mil so yeah i'm gonna start struggling down there in and out in and out get my conduit done so first i've mounted the sockets where they're gonna go on the inside apart from these two that are below the board uh i'm just gonna drill through the back of them so i know where the holes are i'm just gonna marry them all up with the conduit all right so there's my first box that's for the socket up high just bang the laser down it's going to put a couple of clips down and then we've got a hole there and one there and then we're going to take it up and into the mains board using these type of saddles um i'm just going to screw a couple of them down there using them because it's a wooden structure and it naturally will expand or contract whatever especially as it starts to dry out the wood and that just allows movement in the in the conduit so rather than the ones that are a bit tighter wrapped around hopefully i don't get many problems with them look on the stick uh stick a couple down there then i'm gonna do a 90 bend into a through box yeah i can't really get much footage i can barely move all we can do is try do so it's a bit of a good one i did this we'll do it for your entertainment there you go cables in there and there it's just a bit neater you don't have to have control on that back wall then obviously we've not got much options over here it's quite a lot of lights going on switches there's nothing you can do about that this is neat as i'm ever going to get it so then all i do here is give it a dust separate the two legs it's a bit awkward one-handed so bear with me separate the legs like that and put a link in between obviously you've got to try and make sure you always keep your legs separate on uh when using singles you always end up crossing them over same again with that one it doesn't really matter which leg is and then put a link in between so that's that wired as you just seen from the other side and around the back of here we got some box lids grass screws and uh rubber gaskets that go first so just to give it a bit of water tightness so siliconed up i've even put a little bead of silicon over the top of the box just to stop any water sleeping down the back of it probably not necessary it's quite undercover around the back of here anyway um but yeah why not i wouldn't normally do that because it's a bit ugly but no one's going to see anything around here anyway either i'm going to get them on we're done can move back on in there start doing the board and the sockets whatever is that even the tune if i just done that wrong it's not even that tune is it or is it i don't know i can't remember all right so i've sealed up them holes so i'm just gonna give them time to at least skin over a little bit i'm just going to do the switch and this light and stuff first and then i'll do the board leave the sockets and stuff to last hello it's a nice candle in it for him he's gonna be and everything this dog dart board mental what some people do for the dogs [Music] so there's the switch feed-in feedback out that's a permanent feedback out up to the um pir floodlight obviously that's not switched at all that's just permanently on it comes with every bowl if you want to turn it off obviously the feeds are just linked through up and we've got three switch wires one for the outside lights inside the door one for the bar and one for m3 nerves obviously just where you go obviously you could probably say when you're wiring in singles what's the point pulling on earth there strictly in case you ever change it for a metal plate or testing purposes it's easy to get a test reading there if you want to uh yeah so why not all right that's sockets on apart from that spur i need to check my van for one i didn't order one for this job because it was wasn't part of the original quote anyway yeah that lights a little bit low it's going to be tied up and hooks on the back of there to get the height board is done any electricians are watching do you all find it harder when it's uh got less circuits to get a neat and easy board i mean obviously it's not it's not that bad yeah so we've got two 20 amp radials and then a six up lighting circuit i was just going to do one radial in here but uh it made wiring wise it made sense to just do a radial for that back wall which is all external and then i got a radial through the lighting tube let's call it just for that socket and the outside socket so yeah it made sense obviously i could just double them up but i've got the spare ways it's a four-way board the main switch it did actually come with this type a rcd but doing away with that but main switching because that's all they had in stock so yeah a bit of testing now go and connect up the other end of the armored first obviously those from dead tests and uh yeah should be done nice little job i love these jobs here's box all done quite nice didn't have a spur there so we need to get a blank plate and that does the outside lights sorry about the flicker they're not really flickering [Music] yeah looks good [Music] i think it looks really nice another couch over there and the tv up on the wall and stuff that's done pretty much didn't get much footage because i'm on my own today so trying to get stuff done um as you can see i'll spin the camera around actually one of the bulbs missing the outside light which i'll show you in a sec as always i hope you enjoyed the video don't forget to subscribe be really happy about that leave a comment like show us a bit of love see you on the next one"

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"VideoID": "495",

"Title": "Horn relay wiring (Car horn relay wiring diagram)#shorts #electricalcircuit #wiringdiagram #circuit",

"URL": "https://www.youtube.com/watch?v=H71ZjTO\_5\_8",

"Keyword": "Electrical wiring installation",

"Transcript": "how to make Cajon relay circuit [Music]"

},

{

"VideoID": "496",

"Title": "Underground Electrical Wiring &amp; Codes For A Spa",

"URL": "https://www.youtube.com/watch?v=KFpZBMICh5A",

"Keyword": "Electrical wiring installation",

"Transcript": "hey guys Joshua Peterson with Peterson electric here I'll try to be as loud as I can there's some tractors going on here customer here had a really good point I need to do an updated video on an underground situation for a hot tub I'm going to have him back up just a hair to see this so this is considered tearful if this is considered an island because you're coming out here to come by itself so it's a floating island he's putting cement right through here which the code speaks in 300 not five that if you do that you're allowed to put the men over it video happy they're also going to portable right here cement okay otherwise I have to be two feet deep on this this allows us right here expansion Club that allows the ground ship without written it on the camel that drill one inch hole right here to this and I won't take credit but this which means idea and I love this and I'm going to use this for now on but this is the three-quarter inch half a thing on an irrigation pipe with the hall in people [Music] by blowing water they're like no fracking group accordian cannot use nineteen underground I use 45 underground you will not be able to get it through this is a one inch but it fits reporters with the 50m size on the wire for the hostages never get it through so he did a great job with the one inch but what we needed was this heat box so he - five - usually you can't rent them and Home Depot and Harbor Freight won't bow itself stuff like this but my wholesale sale it's a four footer there are about 300 bucks you can go to an 8-footer and they're about six seven eight hundred dollars pay on where you get it but we got this new and this just keeps it up at about six thousand watts and you turn that on you just let that cook for a while and it just rotate this does happen to it so when we heat it up the fitting for our bend you get almost like a 60 and 90 right here okay and then it was able to connect this has to be scheduled 80 underground to schedule 40 as you come through we bent this one here we cooled it with water and then on this side we bent it up at a 90 and we cool that with water so we end up with 90 about a 45 right here sweeping 45 another 45 and 90 so we have about 270 degrees worth of bends but that fish taped this went right through so a few of the tools that you need um a fish tape if you don't own that I think it's cheaper just a hire contractor because by the time you buy all these tools it's just going to be harder for you in the long run we needed a really strong drill because you have a unibit the panel and I've had these bits in here I probably have 500 bucks worth of bits but I've got a few of these and even after years of getting them sharp and they're still getting dull probably have to replace this one in to begin through that hard metal outside archery cabinet it was pretty tough on that panel that yeah this in a bid from wd-40 the heat box PVC glue you cannot use white pipe for irrigation yeah Georgie underground and you cannot use black pipe I've had a lot of landscapers leave me a one-inch and say well go ahead and connect it both in there's no way to adapt that gray fitting to this black pipe for this white pipe you're not allowed to do that whatsoever so if it's not great it's not electrical and if you don't have it in we what we can't do the job for you especially if it's mostly done or for the homeowner did most of it and get a great job laying out just off a hair the biggest concern is they had it sticking over here to go under the tub the problem with going under the tub is you have a stand up piece like this and then if this isn't an exact right spot you're going to hit a motor a seat control panel or a motor so you really have to have your features underneath exact so we can measure that exact tub um the other thing is that then you have to have someone here to drill the bottom success itself it doesn't make it easy then later to maintain because included so better they go on the side of we'll cut that off put an MA put its nectar flex look through and in reduce it from one inch to 3/4 that willing to get infants up to the older three-quarter we don't want to drill that fiberglass or that plastic figures we don't have so this allows the finger to move it causes guys they probably fill it I come back later you don't have to worry about scheduling the cluster and everything and then I just pull the wire fulfill enough iron a little good the other thing is this is a great example a lot of people say all whereby disconnect it is panel within 50 foot"

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"VideoID": "497",

"Title": "How to Read Electrical Diagrams | Wiring Diagrams Explained | Control Panel Wiring Diagram",

"URL": "https://www.youtube.com/watch?v=GHhcyH99inE",

"Keyword": "Electrical wiring installation",

"Transcript": "Do you have struggles reading and using an electrical wiring diagram? If yes, don't worry! By end of this video you'll have a good understanding\nof how to read understand and use it for your benefit An electrical wiring diagram could be a single page schematic of how a ceiling fan should be connected to the power source and its remote switches so that we can turn it on and off A wiring diagram may include the wirings of a vehicle For example, how the horns are powered and connected to the controller on your steering wheel Or an electrical wiring diagram can be a 200-page document including all the electrical wirings of an electrical control panel in a huge factory or plant Wiring diagrams may follow different standards depending on the country they are going to be used They may have different layouts depending on the company and the designer who is designing that They also may be drawn by different ECAD software such as EPLAN or AutoCAD electrical So when you see a wiring\ndiagram for the first time you may need some time to analyze it and become familiar with its layout and symbols As there are plenty of videos about vehicles’ wiring diagrams ceiling fans and other appliance out there in this video we decided to specifically investigate an industrial panel wiring diagram However, some rules of thumb will be applied to most of\nthe wiring diagrams in general So, before we continue please subscribe and click the notification bell and stay with me to the end as I have very interesting\npoints to tell you Let's start with an actual example of a wiring diagram This document includes more than 140 pages but we’ll check only some of the pages as the rest of them are somehow similar Every wiring diagram includes hardware components Power sources Ground chassis Terminals some wires of course and numbers letters and maybe some nomenclatures Normally, the very first step to learn reading a wiring diagram is becoming familiar with the symbols of the equipment and each wiring diagram is supposed to have a page or two for this purpose This page is known as Legend\nand abbreviation page To have a quick look at the symbols you see a three-phase AC\nelectric motor symbol here This one is the symbol for a solenoid valve This is a symbol for a contactor This is the coil and these are the contacts Remember that these symbols may have\nsome minor differences in different wiring diagrams depending on the ECAD software they have been designed with As an example the Fuse in EPLAN software looks like this But, in AutoCAD electrical it looks like this! By the way, you’ll get used\nto these symbols very soon Ok, let’s start with the first page to see how much it could be easy to read and understand a wiring diagram First of all there is a rule of thumb in\nstandard wiring diagrams that you should read the diagram from left to right and from top-down Exactly like reading a book! But sometimes designers make some exceptions to have a better layout such as this page So as an exception we should start from the downside and this is where the three-phase\npower enters the panel As a reminder the voltage level and the frequency of the power\ndepends on the country we’re implementing our project For example, in England or Austria the voltage level is 400 volts\nwith 50 hertz of frequency But in the United States a three-phase power source will produce 480 volts with 60 hertz of frequency As you see, the power\nenters the terminal blocks with the “X0” terminal strip The terminal strip is a mark that refers to a group of terminal blocks with the same voltage level or the same purpose From these terminal blocks we move on to a three-pole\ncircuit breaker with thermal and short circuit protection capability As another rule of thumb the wiring diagrams are drawn\nin the neutral condition Meaning that all of the contacts contactors circuit breakers, etc. are shown in their normal or non-energized condition Therefore, this contact is closed because it is a normally-closed contact and the rest of the contacts are open We have a great video\nabout NO and NC contacts and their actual application examples that you can watch it using the\nlink in the description if you wish After closing this circuit breaker manually the power flows toward\nsome power distributer bars from which some branches can be taken One of the branches goes into\na two-pole circuit breaker and from there powers a transformer If you’ve noticed there are some numbers on the wires These are called “wire tags” Wire tags are very helpful\nin case of troubleshooting so that when a wire gets\nout of its connection point you can easily look at the wiring diagram and figure out where it\nshould be connected again There are the tags for the\ndevices within the panel as well If you were looking at the wiring diagram and you didn’t know what this device is then you could find it in the panel using this tag This transformer converts the 400 volts to\na single-phase 230 volts to feed the power receptacle or socket the heater and the fan The “ST19” tag refers to a thermostat to\nturn on and off the heater or the fan on its specified\ntemperature setpoints You’ve also noticed the earthing chassis and its branches wherever it's needed Before we continue to the next page you may ask, what these\nnumbers on top of the page are This is a very good question! Actually, these are the column numbers and they have divided\neach page of this drawing to 10 columns As you see, there are some\ndevices in each column and we can use these column numbers in combination with the page number to address different devices contacts terminal blocks, and so on in other pages Let me explain it by some examples For instance the main three-phase power\nis shown with some arrows and numbers on top of the page All of them have a 2.0 number just beside the arrow By “2” it refers us to page two And by “0” it points out to the first\ncolumn of page two And there you go! It’s our power source on page two As another example the number below this contact says page number 130 and column number 6 I’ll turn to page 130 and this is column number 6 and there it is! The same tag KA1306 as we had expected It looks like a coil But not the coil of a contactor the coil of a relay And how do I know that?! If you have seen the legend and\nabbreviation page of the drawing you know that the “-KA” is a nomenclature for\na relay in this drawing Below the coil you see the 13-14 contact of page two and also the other NO and NC contacts of this relay with the addresses they have been used in this drawing We’ll come back to this page very soon On page two, the mains power source is feeding a 24-volt power supply and it provides us with a voltage of 24 with 10 amps of capacity From there we have extended this voltage using some terminal blocks so that we can deliver the power to different instruments PLC cards PLC CPU or whatever device which\nneeds 24 volts to power on But wait! This part of the drawing seems a little bit strange as all of these terminals\nhave the same tag of “XC” There are a variety of terminal\nblocks in the market In this case, to save\nsome space in the panel we have used some double-Level\nterminal blocks They occupy the same space as the ordinary terminal blocks but we can connect two\nwires to each side of them In the following we have a branch that\ndelivers the 24 volts power to page 12 column zero but with two interlocks An interlock means a condition Let’s turn to page 130 again to see what those conditions are Did you notice that we have to get back and forth between different pages? This is the only way we have to take to fully understand these drawings In this page, we’ve a safety relay here and it will be used to protect people material and the machine itself when the machine is operating Remember that the designer\nof this wiring diagram had to refer to the datasheet\nof this equipment to complete his job In fact this is a very important\nand inevitable stage of designing a wiring diagram and we should always do the same thing for the rest of the equipment used in the process By the way these two channels are used to be connected to the\nsafety components at the site For example, the safety barriers and if the area is evacuated then these channels will be activated and as a result these NO contacts become closed Thus the voltage will be transferred\nto the A1 connection of the relays’ coils and finally, the coils will be energized Therefore, our 13-14 NO contacts\nof the relays become closed In this way our 24-volt power will be transferred to page 12, column zero Let’s pause this part here and we’ll continue the next part by reading and understanding the PLC VFD and their power and\nsignal cabling and wiring I hope you’re excited for the next\nparts of this multi-part series If yes please subscribe and click the notification bell to don’t miss the next videos"

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"VideoID": "498",

"Title": "DIY Camper Van Electrical Install START TO FINISH w/EXPLORIST.Life Wiring Kits | Van Build Series 12",

"URL": "https://www.youtube.com/watch?v=3Gr3rr4cPQQ",

"Keyword": "Electrical wiring installation",

"Transcript": "thank you to explores.life for sponsoring today's video welcome to my channel my name is Lauren and I am self-converting my Ram ProMaster to live travel and work in full-time on the road in today's video I show you how I installed my entire electrical system from start to finish with the explorist.life all-in-one wiring kit this video will include planning tips prepping the box to house all my electrical components highlighting tools you'll need for the install wiring the battleborn battery Bank the victron lynx distributor the chassis ground the victron multi-plus inverter charger the 120 volt AC distribution panel Shore power the 12 volt DC fuse panel the victron smart solar mppt charge controller Rich solar solar panels the solar isolator the victron DC to DC alternator charger and then I'll round it out with some wire management tips also check out my last video where I walk you through step by step on how to plan and install your pre-wires which also includes information about wires and wire gauges that will help you to better grasp the information in this video and be sure to hit the Subscribe button down below so you don't miss my next video which I will be explaining how my electrical system will function followed by other videos like wiring my Puck lights Outlets appliances and more as usual check the timeline of this video for time codes that will allow you to jump around to different sections and check the description box for a link to explore.life's website with that let's get started when it comes to electrical systems they can be done very simple or complex cheap or really expensive built-in or portable so be sure to consider your specific wants and needs before making any electrical decisions personally I will be living out of my van full time so I wanted a system that was large enough to power various appliances lights and outlets for the normal conveniences you would find in a home after months of researching what to buy I finally purchased my main components from battleborn but soon after I received my order I realized I wasn't even halfway done with researching and decision making because now I needed to connect all the components together which meant many more countless hours of research to follow and buying more material so when I came across the explore stock life wiring kits I was beyond grateful this box contains all the components of the Explorer's life all in one wiring kit which includes everything I need to wear my entire electrical system I mean it has the victron links distributor 12 volt and 120 volt distribution panel the master switch all of the wires wire lugs heat shrink ferrules fuses mounting hardware and so so much more the great thing about the wires is they are properly sized to my specific setup ensuring a safe and effective install explore statlife also includes a sheet of paper in the box that lists the gauge and length of wire provided for each part of the wiring process the smaller items like wire lugs ferrules heat shrink fuses mounting hardware and so forth all come in these tiny bags that are individually labeled so you know exactly what pieces go to what section of the electrical system having these components is separated and labeled accordingly and having the wire reference sheet makes this kit very straightforward not to mention when you order their wiring kits online they offer a range of wire sizes and variations that you can choose from depending on your specific application and you can buy individual wiring kits for each section of the electrical install like the battery Bank wiring kit or the victron link Distributor wiring kit or the 12 volt DC distribution panel wiring kit if you don't need all the components you would get in the all-in-one wiring kit additionally because explorers.life sources these products themselves they have excellent quality control and ensure that every component they are sending you are compatible with one another which they themselves know because they've installed their own kits into multiple Vans this kit takes the guesswork out of the entire install saves you countless hours of researching the topic yourself running to the store to buy each individual little piece and ordering online where you risk quality and compatibility of the random items that you will purchase explorers.life has already done the legwork for you they have analyzed every detail to ensure a safe and effective install they have read and understand the manuals of all the components which I don't know about you but I rarely read manuals and definitely not as thoroughly as they have they have provided extremely detailed wiring diagrams for you to follow they have provided countless step-by-step articles and countless step-by-step YouTube videos sharing everything with you from what tools to use to how to choose the correct wire size how to wire solar panels teaching you about folds and amps and more so why try and reinvent the wheel when they have already done the work for you it's a great investment and the best thing about it is they are very competitively priced and offer free shipping on most orders so why would you waste all that time researching and ordering each individual part for around the same cost as just ordering the kit from explorers.life as you can tell I truly love explorers.life and I thank them for their countless resources and product offerings that they offer to people like you and I who are doing our own DIY camper van electrical install thank you Nate Steph and team truly you guys are the best so be sure to check the description box below for a link to explores.life's website YouTube channel and a few of my favorite resources they have created for you and I now it's time to get on with the install I am so excited to show you guys let's do this before jumping in and wiring all the components together it is important that you take the time to think through the electrical layout and plan accordingly I would recommend getting all the electrical components and your physical possession so you can move items around to determine the most efficient orientation also it is crucial that you consider how everything will be wired together sure your battery Bank can fit here in the distribution panel there and the inverter here but is it the most logical location in relation to how the components will connect together you don't want wires running everywhere in a dozen different directions entangled amongst one another which can cause a safety hazard make it challenging to service the system and can add confusion during the install after taking the time to plan my layout I use tape to map it out in the Box until I became familiarized with the system I also took a video of the tape as referenced during the install if needed and I'd recommend you do the same now that I know how my electrical system will be arranged it is time to prep the box for permanent install to start I drilled holes for various wires to feed into the box like the chassis ground wire BMV 712 battery monitor data cable solar wires Shore power wires and all my 12 volt and 120 volt wires running throughout my van to do so I used a one inch and two inch hole saw with my drill as well as a 5 16 inch drill bit to make these various holes in their proper locations from there I sanded the Box applied Edge banding to the ugly plywood ends that would be visible in the van painted the inside and outside of the box and added a rubber tape with Gorilla Glue to the holes I drilled in the Box to protect my wires stay tuned for a future video where I will share in more detail the process of sanding Edge banding and painting all of my Cabinetry next I installed the box back in the van fed all the wires into their designated holes and screwed it down permanently to my subfloor at this point I made a board to hold my distribution panels in the Box I measured cut drills pocket holes sanded Edge banded and painted the board before installing it with pocket holes and L brackets lastly I installed an aluminum track to secure my battery Bank in place to do so I bought one inch by one inch aluminum angle that will go on all four sides of my battery Bank to cut the aluminum I used a miter saw and a wood blade since the aluminum is a soft metal I placed a board on the angled aluminum to help hold it in place while I cut slowly with the saw remember to wear eye protection as many metal shavings will fly into your face to screw the aluminum track to the box I drilled countersink holes along the side of the aluminum the counter bit drill will allow the screws to sit flush to the aluminum which means the batteries will also sit flush to the aluminum at one end of the battery bank I screwed two lashing straps under the aluminum with 10 by three quarter inch wood screws these lashing straps will be used to hold the batteries in place and secure it then I screwed down the other three aluminum sides and installed all four batteries in my battery Bank make sure all the positive terminals of the battery bank which are red and have a plus sign are on the same side of the battery Bank and all the negative terminals which are black and have a negative sign are on the other side of the battery bank for easier cleaner and a safer install at the other end of the battery bank I screwed in two hooks to run the other end of the lashing strap through once that was completed I tighten the lashing straps around the battery Bank followed by a good wiggle test to make sure the batteries weren't going anywhere to finish I ran the vacuum through the box to clean up any wood and aluminum shavings created during this process now the box is ready to house my electrical system I'm going to touch on the tools you'll need to measure cut strip crimp and heat shrink wires as well as some handheld devices to use for your safety and to troubleshoot the system throughout the video the process remains consistent when making wire connections you will measure cut strip crimp and heat shrink wires to measure wires of course you can use a measuring tape or ruler but personally I loved using this combination Square which you can set to a desired length so you can just lay the wire against the tool and mark the wire insulation with the pencil this is especially helpful because many times you will need to make the same measurement back to back so this makes the process a lot quicker once the wire is measured it needs to be cut to cut wire that is 14 gauge to 22 gauge I'm using these four inch spring-loaded Flush Cutters for wires up to six gauge I am using these eight inch diagonal cutters for wire up to 2 ought I'm using the Klein 63030 coaxial Cutters which also cut through 10 3 wire and for the largest wires like for ought I'm using 12 inch cable Cutters which also cuts through the six gauge three conductor wire that runs from the multi-plus to the breaker box the longer handles give more leverage to cut through the thicker wire now for out wire can also be cut with the client 63030 coaxial Cutters but personally I found the 12 inch cable Cutters to be easier if I had to choose just one of these wire cutters to purchase for this install it would be the client 63030 coaxial Cutters hands down after measuring and cutting your wires you will need to strip back the wire insulation to expose the bare copper wire which allows you to insert that into a terminal or to crimp on one of the many different types of wire connectors to strip wire I am using these self-adjusting wire strippers which are fast and easy to use for 22 gauge wire up to 10 gauge wire and it can also strip flat multi-wire conductors up to 10 3 wire with two cuts it also strips multiple wires out once adding to its efficiency for wires 6 gauge to 12 gauge I am using these Klein wire strippers but because I have the self-adjusting wire strippers I only use these for the six gauge wires place the wire in one of the four slots provided which are each labeled for the wire gauge you are stripping squeeze the handles to cut through the wire insulation and then pull the insulation off for big wire you can use the Klein 63030 coaxial Cutters by spinning the tool around the wire applying just enough pressure to cut through the insulation or you can use this cable knife for four gauge to 4 ought wire to adjust the blade depth twist the circle on the bottom of the tool then push the head of the tool up so you can feed the wire into it let go of the head so that it can squeeze down on the wire and then twist the tool around the entire wire this is nice to have if you are stripping multiple wires that are the same gauge back to back because once you adjust it to cut through the thickness of the insulation you can keep it set to that depth to strip the other wires but in all honesty I only use these to strip the six three wire running from the multi-plus to my 120 volt distribution panel and I'm sure the client 63030 coaxial Cutters could have stripped it as well so it is not necessary and it's just another option I wanted to try out and share with you now it is very important that you strip wire carefully to avoid cutting the stranded wire itself you only want to score the installation enough for you to rip the installation off by hand for stripping Tools in this specific install you can get away with just the client 63030 coaxial Cutters and the self-adjusting wire strippers now the wire is measured cut and stripped it may need a wire connector crimped on the bare wire conductors include but are not limited to wire lugs mc4 connectors spring terminals Spade connectors Fork connectors ferals butt splice connectors and so forth as you can see here some connectors can be purchased insulated or non-insulated I'd recommend insulated connections when possible which are the connectors with the plastic covering that helps to keep connections secure and prevent damage also look for heat shrink activated connectors to seal off the connection for moisture as you can see here insulated connectors are color coded a red connector is for 18 to 22 gauge a blue connector is for 14 to 16 gauge wire and a yellow connector is for 10 to 12 gauge wire make sure you are using the correct size connector on the correct wire gauge for ring terminals Spade connectors and butt splice connectors 22 to 10 gauge I have these ratcheting wire crimpers with a flat jaw so the insulated connector doesn't get damaged the crimper has three sets of teeth that are color coded match up the color of the connector to the same colored set of teeth on the ratcheting crimper and squeeze the handles to crimp down on that metal section of the connector the crimper handles need to be squeezed fully in order for the tool to release itself four eight gauge wire to 4 ought wire you need to cramp on wire lugs to do so I'm using this big crimper right here to start place a tool on a solid work surface lift the handle insert the wire lug with the top of the lug facing the thumb adjuster and the bottom of the lug facing the punch then push down on the handle this will drive the punch into the bottom of the lug and curve the top of the lug making a strong connection that can withstand a very heavy Force to accommodate different size wire lugs use a thumb screw to slide the mechanism to the correct gauge as indicated on the side of the tool now when it comes to ferals you can buy crimpers that crimp ferrules into square hexagonal or trapezoid shapes this is helpful because for certain connections like the mppt charge controller the receiving terminals are squared shaped which would best accommodate a ferrule that is crimped into a squared shape now let's take a step back a wire ferrule is a thin metal tube that slides onto your stranded wire it can also be insulated like these ferrules right here the purpose of ferals is to clean up the wire ends which allows for a safer and cleaner install because it prevents straight wires going into the wrong terminal and causing a short in the system simply place all the stranded wire ends into the ferrule place the metal tube into the ferrule crimper and squeeze the handles note that the ferrule gauge must be the same gauge as the wire and the stripped wire end should run the full length of the ferrule this feral crimper is good for wires 8 gauge to 12 gauge and it came with a pack of ferrules that I was able to use for my 120 volt AC wires when wiring the distribution panel the last thing I will say about ferrules is actually a direct quote from Nate at explorers.life he says that a ferrule is a tool and not a necessity so if it is hindering more than it is helping it does not need to be used you will see during the install there are times when I use ferals in times when I did not many times I did not use the ferrules provided because there were six gauge ferrules and unfortunately this feral crimper tool does not accommodate six gauge ferrules other times ferals were not used because it added too much bulk or it didn't fit into terminals so I opted for Bare wire instead the last crimper I'll mention is specific for mc4 connections made on your solar panel wires it has a tooth design that folds the metal connector into itself making a tight crimp when crimping any connection make sure the wire is fully in the lug and doesn't fall out during the crimp and make sure all the stranded wire is in the connector to prevent a safety issue to easily add the wire into a connector simply twist the stranded wire ends together and slide it into the connector also for a wire run with a wire lug on both sides make sure the wire lugs are facing the same direction for an easier installation for crimping connections throughout this install you will need all the crimpers that I mentioned to finish the connection use a heat gun to melt the heat activated adhesive on the heat shrink so it conforms to the barrel of the wire lug or ferrule and the wire itself once you see glue coming out of both sides you know it is applied correctly this seals off the connection from moisture and can help strengthen the bond with the Explorer's life wiring kits they provide heat shrink that does fit over the wire lugs so you can add the heat shrink itself to the wire after a wire lug has been crimped onto it but if this was not the case you would want to put the heat shrink on The Wire before crimping on a wire lug after you have measured cut stripped crimped and heat shrinked your wire wipe down all the wire lugs with rubbing alcohol and a cloth to clean up any dirt and grime buildup to provide a better electrical connection now I will touch on two devices that are essential for your safety to troubleshoot the system and to test for reverse polarity these two devices are a multimeter and an ac voltage detector the multimeter serves several functions but for this install I will be using it to test voltage throughout my install the multimeter comes with two test leads a black one that always goes into the negative or com labeled Port of the multimeter and a red one that is positive and goes into the input or the port labeled for whatever you are testing for on the multimeter the V with a straight line above it is for DC voltage which can be used to test the voltage of a battery or solar panel and the V with a squiggly line above it is for ac voltage which can test the voltage of a standard household Outlet to turn it on turn the dial to what you are testing for in this case I will turn it to V for voltage once turned on don't let the two test leads come in contact with one another and do not touch the metal prongs of the test leads when measuring voltage because you will get shocked at that voltage and personally I have no desire to learn what 120 volts would feel like not only does this device tell you the voltage but it also tells you what is positive and negative see here I am placing the red test lead to the red terminal on my battery and the black test lead to the black terminal of the battery and it tells me a voltage note that even though my batteries are 12 volts numerically the battery and other items can vary slightly and a 13 to 14 Volt reading is pretty common now if I switch the test leads to go on the opposite colors black to red and red to Black you will still get a voltage reading but it will have a negative sign at the start which indicates reverse polarity now the ac voltage detector is pretty straightforward if it comes in contact or even near 120 volt current it beeps to let you know not to touch that connection the last tool I would recommend for this install is a label maker a label maker is important for labeling the breakers and fuses and the distribution panels so you know what the wire run is for also you'll want other tools and material handy which includes but is not limited to a half inch a 9 16 inch and a 5 16 inch wrench and sockets a torque wrench small and large flat head and Phillips head screwdrivers a drill an impact driver hole saws needle nose pliers a one inch step bit 3M VHB double-sided tape Rust-Oleum stop rust clean metal primer and protective enamel foam brush and so forth hopefully you found this section to be helpful I will be linking all of those tools Down Below in the description box for you to go and purchase and yes I know the cost of tools can add up very quickly but these are really critical so you can make good solid long-lasting connections that aren't going to cause a safety issue that you won't have to troubleshoot your entire system to find that one bad connection and honestly it's just gonna make this whole process go by a lot smoother if you have the right tools so do it right the first time so you don't have to worry about it down the road now that you know what tools are needed for this install I want to quickly cover five fyis to help you throughout the install then we will begin wiring the system number one the wire gauge is almost always printed on The Wire insulation along with other information like the temperature rating and type of wire so when you are referencing the paper in the Explorer's life all in one wiring kit you can be sure you are choosing the right wire to work with number two the wire lug sizes are imprinted on The Wire lugs the first number will be the wire gauge it is meant for and a second number will be the diameter of the hole on the lug for a bolt to fit into it so this 4 up by 5 16 inch wire lug means it goes on four odd wire and will fit on a 5 16 inch Bolt number three when you fasten any connection with a wire lug the wire lug must be making direct contact to the electrical component for example never ever put a washer between a wire lug and another electrical component like a battery terminal or the lynx distributor bus bars because the washer will interfere with the flow of electricity and end up melting things in your system also note that the lock washers will always be placed below the head of a bolt or before a nut with a washer on the other side to protect the wire lug or other electrical terminal additionally all the connections in this install has a recommended torque spec listed by the manufacturer that should be followed for every connection torque specifications ensure a safe and effective install if a connection is too tight or too loose it can cause unwanted and unsafe heat which could melt components or start a fire also when you add the mega fuses to the lynx distributor remove all the hardware on the middle stud except the last piece which is a nut the mega fuse will rest on top of that nut number four if you purchase victron Bluetooth components download The victron Connect app which will allow you to Monitor and control components of your electrical system via Bluetooth when you are in range also I would highly recommend reading through the victron wiring unlimited book which I have linked below because it has a lot of great information lastly number five I would highly recommend ordering the main components directly from battleborn because they will program your entire system before sending it to you so you can ensure everything is set to the correct parameters and you don't need to figure it out on your own and a couple bonus fyis because why not make sure whenever you are installing your electrical system there is good ventilation to prevent the units from overheating to achieve this drill holes in the enclosure install a vent or install a 12 volt fan inside the enclosure that you can turn on and lastly when you feed wires into a terminal make sure there is no wire insulation in a terminal which will affect the electrical connection and can potentially melt the connection due to added heat and do not have bare uninsulated wire outside of the terminal which can cause a safety concern like electrocution and a short circuit now that you have those fyis to reference it's time to wire the battery Bank my battery bank will consist of four 100 amp 12 volt lithium deep cycle batteries that I purchased from battleborn to wire the batteries together I am using the explorest life battery Bank wiring kit which includes everything you need to wire up to six batteries with four op wire it includes five feet of red four out wire 5 feet of black four out wire twenty four up by 5 16 inch wire lugs 10 pieces of black one inch heat shrink and 10 pieces of red one inch heat shrink to start measure and cut seven inch long pieces of wire from each five foot section of red and black pour out wire this is a good length of wire to connect one 100 amp battleborn battery to another 100 amp battleborn battery when they are positioned side by side since I have four batteries I only need three black and three red seven inch four out wires explorest.life intentionally provides extra wire in this kit in case you are using different batteries or a different wiring configuration next strip back 7 8 of an inch of insulation on both ends of the seven inch wires then crimp the four off by 5 16 inch wire lugs onto the ends of each wire once the lugs are cramped securely on the wire ends add the adhesive heat shrink to both ends with a heat gun now the wires are cut stripped crimped and heat string together it's time to clean off the wire lugs and battery terminals with rubbing alcohol and a cloth to remove any dirt or Grime buildup to provide a better electrical connection finally bolt everything together with the hardware included with each battleborn battery which includes stainless steel bolts washers and nylon nuts which help to reduce the chances of the connection becoming loose you will notice that the hardware includes two longer bolts and two shorter bolts personally I use the two shorter bolts focus on wearing one side of the battery being first before wiring the other side the red wire goes on the red positive battery terminals and the black wires go on the black negative battery terminals the install goes Bolt washer battery terminal wire log washer and nylon nut after hand tightening the bolts and nuts go back through and tighten all the connections if you have a torque wrench bring the connections up to battleborn's recommended torque spec of 11 foot pounds every battery manufacturer has their own torque specifications so if you are using a different brand be sure to check the manual for Direction for battery terminals that get two wire lugs both lugs should go on the same side of the battery terminal so the current can easily go from one wire to the other instead of having all the power jumped through the terminal also be sure the wire lugs are flat to one another and the terminals any gaps will create unwanted and unsafe Heat there are four correct ways to connect battleborn batteries according to the victron wiring unlimited book but this configuration tends to be the easiest and cleanest now that the battery bank is wired it's time to connect that to the victron lynx distributor here are the components needed for this part of the install the victron lynx distributor victron BMV 712 battery monitor and the Explorer's life links Distributor wiring kit which includes five feet of red 4 ought wire five feet of black four out wire four four ah and 5 16 inch wire lugs two four odd and 3 8 inch wire lugs four one inch red heat shrink two one inch black heat shrink 1 18 to 22 gauge butt splice connector a pair of lynx adapters a blue c Master battery disconnect switch a 400 amp ANL fuse a blue c a l fuse holder shunt and switch spacers and assorted screws to mount the Link's distributor shunt Master disconnect switch and ANL fuse holder in place to start grab the shunt from the victron BMV 712 battery monitor box and the shunt mounting hardware from the Explorers life links Distributor wiring kit temporarily Mount the shunt in place to take a measurement with the negative black 4 out wire that will run from the shunt to the furthest negative battery terminal since wires exiting the battery Bank should be on opposite ends of the battery Bank make a mark on The Wire so you know where to cut then cut strip crimp and heat shrink a 4 off by 5 16 inch wire lug onto the end of The Wire that will attach to the battery Bank and A4 off by 3 8 inch wire log onto the end that will attach to the shunt next is the positive wire that goes from the battery Bank to the lynx distributor before the positive wire gives to the lynx distributor it has to go through the main system fuse as well as the main battery disconnect switch so I started measuring cutting stripping crimping and heat shrinking lugs onto the four odd wire the battery end and ANL fuse connections get a 4 off by 5 16 inch wire lug and the end connecting to the battery disconnect switch it's a 4 off by 3 8 inch wire lug it is important that both of these wire runs have an identical linear distance from one side to the other taking into account the fuse shunt and master switch so that the battery Bank drains and charges evenly next clean all the wire lugs with alcohol and a cloth then it's time to begin mounting and connecting all the components when mounting the shunt the orientation of the unit does indeed matter there is a battery side and a load and charger side of the shunt as indicated on the side of the unit Mount the load and charger side in the direction of where the lynx distributor will be mounted for connection later remember to apply the shunt spacers between the shunt and wall once the shunt is mounted connect the negative wire with a 3 8 inch wire lug to the battery side of the shunt and the Order of bolt lock washer washer wire lug then shunt then connect the other end of the negative wire to the furthest negative battery Bank terminal by loosening the current connection and adding the wire lug flat against the other lug for a solid and safe electrical connection thus it will go bolt washer battery terminal battery negative wire log shunt negative wire lug washer lock washer and nut clean up the connection by adding zip ties to the negative wire run from the shunt to the negative wires connecting the battery Bank then add a lynx adapter to the load and charger side of the shunt in the following order bolt lock washer washer Lynx adapter then shunt for the positive wire connection remove the back cover on the master disconnect switch and loosen the two nuts with a 9 16 inch wrench for the side of the switch that will connect to the lynx distributor add the lynx adapter on the other side add the positive wire with the 3 8 inch wire lug that will run to the ANL fuse holder you can ignore the input and output writing on the back of the master switch as it does not matter what side you use for either connection then tighten the nuts back on and add the back cover to the switch next loosen a nut on the fuse holder with a half inch wrench and add the 5 16 inch wire lug onto one of the outside studs then tighten the nut back on from there use the ANL fuse holder mounting hardware from the Explorer's life Lynx Distributor wiring kit to secure the unit to the wall to mount the disconnect switch use the long screws and spacers from the Explorer's life links Distributor wiring kit remember to put the spacers between the switch and wall the spacers for both the switch and shunt help to push the unit off the wall enough to sit flush with the lynx distributor bus bars for a seamless connection to the lynx adapters on the opposite end of the fuse holder add the other positive wires 5 16 inch wire lug then run the opposite end of the wire to the nearest positive battery terminal there will likely be excess wire because as I mentioned earlier the linear distance of the positive and negative connection needed to be identical so just coil up the excess wire to keep it semi-organized and out of the way then I prepared the lynx distributor for mounting by removing the black and red end caps over the bus bars and unscrewing the lid to expose the four mounting points to fasten the unit to the wall with the lynx distributor mounting hardware from the Explorer's life Lynx Distributor wiring kit once mounted connect the lynx adapters to the lynx distributor the shunt links adapter goes to the negative bus bar of the lynx distributor and the master switch links adapter goes to the positive bus bar of the lynx distributor the order will go bolt washer links adapter links distributor washer lock washer and nut tighten the connection with a half inch wrench and socket now it's time to grab the power wire from the BMV 712 box to wire it to the lynx distributor and shunt this wire will power the computer board on the shunt for the BMV 712 battery monitor that also sends power to the display gauge use a 5 16 inch wrench or socket to loosen the lynx distributor Hardware on the furthest top right stud then connect the ring terminal end of the wire to that stud connecting it here will allow the power to the BMV 712 to be disconnected when the main system switch is turned off if you want the BMV 712 to stay on all the time you'll want to connect this wire somewhere on the battery side of the switch personally I like the option of being able to turn off the entire system with no loads running and that is why I am wiring it this way re-fasten the washer lock washer and nut to the stud over the ring terminal with the 5 16 inch wrench or socket as you can see this power cord is way too long for this application and that is why explorers.life has included the butt splice connector and their Lynx Distributor wiring kit so the wire can be cut down to a more appropriate length put the power cord after the fuse which is this black object then strip the wire end and crimp on the butt splice connector repeat those steps on the other half of the wire that was cut and finish by heat shrinking the bust splice connector from there I ran the power cord through the lynx distributor and plugged the ferrule end into the B1 terminal of the shunt which is the terminal closest to the battery side of the shunt next grab the white data cable and the BMV 712 box connect one end to the shunt and the other end to the back of the battery monitor display which is also found in the BMV 712 box to mount the monitor use a 2 and 1 8 inch hole saw to drill a hole in the wall or Cabinetry that you plan on mounting it to Slide the monitor into the hole and screw the back ring back on the monitor to secure it in place a face plate is also provided with the unit if you'd like to use that as well lastly Bolt the 400 amp main fuse onto the two inside studs of the fuse holder then you can turn on the master battery switch which will send power to the BMV 712 battery monitor display oh my gosh we have power oh my gosh that's so cool oh my goodness at this point open The victron Connect app update the smart BMV firmware and change the parameters to match your system to finish I fastened the lynx distributor cover back into place and added the fuse holder cover on after bending one of the side flaps off for my wire to fit underneath it now that the battery bank is wired to the lynx distributor it is time to connect the chassis ground from the body of the van to the lynx distributor for this section of the install I am using the explores life chassis ground wiring kit which includes five feet of black pour out wire two four up by 5 16 inch wire lugs two one inch black heat shrink a 5 16 inch 18th thread by one inch hex bolt a 5 16 inch 18 thread hex nut and a 5 16 inch flat washer lock washer and serrated washer the chassis ground must be connected to the metal body of the van you can achieve this by drilling a hole into a body's Fork rib with a 5 16 inch drill bit or by using holes already provided in the van I am using this hole built into the rib of my promaster's wheel well therefore I made this part of the connection prior to primarily installing the electrical box to begin cut strip crimp and heat shrink the four off by 5 16 inch wire lugs onto both ends of the chassis ground wire and wipe down the wire lugs with rubbing alcohol in the cloth to install the wire lug to the body of the van it goes Bolt washer wire lug serrated washer van body washer lock washer and nut then tighten the connection with a half inch wrench and socket it is important that this connection is touching the bare metal of the fan that is why explorist.life provides a serrated washer which helps to cut through the van paint otherwise you'd have to scrape the paint off of the van in that specific location before making the connection from there I fed the chassis ground wire into its designated hole on the electrical box and bent it up to connect it to the front of the lynx adapter where it connects to the negative bus bar of the lynx distributor the order goes Bolt washer wire lug Lynx adapter Lynx distributor washer lock washer and nut then tighten the connection with a half inch wrench and socket the purpose of this connection is to provide a return loop back to the battery Bank to complete the circuit and blow the main fuse if there is a direct short with a chassis thus protecting the electrical system therefore according to abyc standards the chassis ground wire can be no smaller than one size smaller than the biggest wire in the entire system since the other connections are using four uh wire this means the Trashy ground could be no smaller than three odds but as explorist.life shares they provide for Aunt for the sake of consolidating wires and lugs now that the chassis ground is wired to the lynx distributor it is time to wire the victron multi-plus inverter charger to the lynx distributor for this part of the install I have my victron Multiplex inverter charger that I purchased from battleborn the victron ve bus smart dongle and RJ45 UTP data cable from explorers.life and the explores life multi-plus wiring kit which includes 4 ought red wire for op black wire six four off by 5 16 inch wire lugs two one inch red heat shrink four one inch black key shrink a 400 amp Mega fuse and the inverter charger mounting screws Begin by mounting the multi-plus backer plate to the wall with the five wood screws from the Explorer's life multi-plus wiring kit then hang the multi-plus by lining up the lip on the back of the unit to the flared tabs on the backer plate push the unit down to make sure it is completely on the plate then use the two pan head screws from the Explorer's life multi-plus wiring kit to screw in the bottom of the multi-plus on the left and right side personally I knew this would make a tight fit for me to add wires throughout the install if I mounted it now so I secured the multi-plus to the wall permanently after connecting all the wires to the unit at this point make sure the master battery disconnect switch is off then remove the links distributor cover and the multi-plus front panel to review the computer board also pull off these black separator flaps on the lynx distributor to just get them out of the way they simply snap in and out of place then measure cut strip crimp and heat shrink the four out wires that will go from the lynx distributor to the multi-plus this includes a positive wire a negative wire and an equipment ground wire all of which have four op by 5 16 inch wire lugs clean the wire lugs with a cloth and rubbing alcohol connect the equipment ground wire to the stud on the bottom of the multi-plus inverter charger with the order going multi-plus serrated washer wire lug washer lock washer and nut and tighten the connection with a 9 16 inch wrench or socket then connect the positive and negative wires to the positive and negative battery studs on the victron multi-plus inverter charger remove the hardware from the studs feed the wire up the bottom opening of the multi-plus and add the wire lug and Hardware back on the stud in order of multi-plus lug washer lock washer nut and tighten the connection with a 9 16 inch wrench or socket the other end of the equipment ground wire will go on the center stud of the negative bus bar and the lynx distributor after removing the stud Hardware you will notice a ring terminal on the stud that is part of the lynx distributor remove the ring terminal before adding the equipment ground wire lug and direct contact with the negative bus bar so the order will go Lynx distributor negative bus bar equipment ground wire lug ring terminal washer lock washer and nut and tighten the connection with a 9 16 inch wrench or socket the other end of the negative wire will go on the left most stud of the lynx distributor's negative bus bar remove the stud Hardware add the wire lug directly to the negative buzzbar and re-fasten the washer lock washer and snap and tighten the connection with a 9 16 inch wrench or socket remove the hardware on the two studs directly above the negative wire add the 400 amp Mega fuse to those two studs after cleaning it with rubbing alcohol then add the other end of the positive wire on top of the fuse on the lower stud that the fuse is resting on and re-fasten the washer lock washer and snap with a 9 16 inch wrench or socket now it's time to wire the ve bus smart dongle to the multi-plus so I can turn the unit on and off from my phone and set proper Shore power input current limits when I'm in Bluetooth range using a tiny and I mean tiny flathead screwdriver secure the red wire ferrule to the battery positive terminal and the black wire ferrule to the battery negative terminal of the ve bus smart dongle then connect the positive wire lug to a positive terminal of the victron multi-plus and the negative wire log to a negative terminal of the multi-plus and if you haven't caught on yet it goes multi-plus wire lug washer lock washer nut and Titan with a 9 16 inch wrench or socket plug one side of the RJ45 UTP cable into the ve bus smart dongle wipe down the bottom of the multi-plus with a cloth and alcohol pull off the double-sided safe cover on the bottom of the Fe bus smart dongle and stick it to the bottom side of the victron multi-plus feed the other end of the RJ45 UTP cable up into the multi-plus and plug it into one of the two ve bus ports on the far left side at this point go ahead and turn on the master battery disconnect switch to deliver 12 volt DC power to the multi-plus then turn the multi-plus switch up to on you should hear the multi-plus kick on and see a green light now open your victron Connect app click on the ve bus smart device which is the multiplex inverter charger update the firmware if necessary and then you will see you are connected and that the inverter is converting 12 volts DC to 120 volts ac you can use the app to turn the multi-plus off and on as well as set the shore power input current limits which tells the multi-plus what amperage of shore power that you're connected to so that the multi-plus doesn't pull more than that preset amount so you won't accidentally trip the shore power breaker the multi-plus will pull any overages from the battery Bank this is called power assist now because I purchased everything from battleborn they already programmed my entire system for me but if you need to program your multi-plus you'll need to use a victron MK3 USB dongle that you'll connect to a laptop or an Android phone and the end of the RJ45 UTP cable that was plugged into the ve bus smart dongle to set up your system on The victron Connect app you will see a multi-plus option appear on the app that you'll then click and use the password zzz if and only if you are a trained victron professional not the victron multi-plus inverter charger is wired to the lynx distributor it is time to wire the multi-plus to the 120 volt AC distribution panel here are the components used in this section of the install the 120 volt AC distribution panel from explorist.life and the Explorers life 120 volt AC distribution panel wiring kit which includes six gauge Triplex wire six six gauge enslaved ferrules one one inch black heat shrink a 50 amp Square D home main breaker a wire gland and screws to mount the panel before getting started make sure the master battery disconnects switch and multi-plus is turned off you can test the multi-plus with the multimeter or 120 volt detector to make extra sure it is safe to work on to start strip back four inches of the six three wire sheath and remove the added strings in the coil leaving just the black green and white wire then add one inch black heat shrink to the wire to clean up the edge and add some protection next remove the center wire gland from the multi-plus to add it to the six three wire at the bottom of the wire gland to the six three wire first then the middle section of the gland screw the two pieces together leaving no gaps you will feel resistance because the teeth of the middle section of the wire gland are being pinched inward to make a tight connection around the wire you may need to grab some vice grips to tie in it completely then measure Mark and strip back about 5 8 of an inch on all three wires and cramp on a six gauge enslated ferrule onto each wire end it is crucial that these three wires are the same exact length for installation in the multi-plus terminals having the wires at different lengths will make it challenging and potentially impossible to add all three wires properly feed the 6-3 wire and wire gland back into the multi-plus and add the top piece of the wire gland back over the wires and screw it onto the middle part of the wire gland to help hold everything in place for the time being using needle nose pliers guide the three wires into place the black wire into the line terminal white wire to the neutral terminal and a green wire to the Ground Terminal once the wires are in the terminals tighten the terminal screw with a Phillips head tool finish tightening up the wire gland by hand the best you can then I carefully use a flathead screwdriver to continue tightening the connection now it is time to prep the 120 volt AC distribution panel flip the unit over and use a box cutter to cut away the large hole fasten the wire gland from Explorer's life 120 volt AC distribution panel wiring kit into the hole start by hand tightening the connection and finish with a vice grip to make sure it is installed all the way from there stretch the six three wire from the multi-plus to the 120 volt AC distribution panel area cut it to length strip back the sheath remove the extra string and the wire coil and add a one inch black heat shrink to the wire Edge to clean up the cup this heat shrink was left over from the battery Bank kit but isn't necessary if you don't have any leftovers like I did then feed the 6'3 wire into the cable entry gland of the distribution panel and feed your 120 volt AC Branch circuits that you ran during pre-wearing into the distribution box all the branch circuit wires are labeled accordingly so I know which wire run is for which Circuit of outlets at this point I took a picture of the wires in the distribution box so I'd have that to reference when it came time to label each breaker at this point I stripped back the insulation for each Triplex wire you'll notice this breaker box has two sides for this application we will only be using one side as the other side is reserved for campers with 50 amp Shore power service with two hot legs incoming or for powering circuits from the multi-plus AC out to which is for circuits only powered when Shore power is connected then I inserted the 50 amp Square D home main breaker on the back bottom of Breakers there is a notch that will sit on the middle lip of the distribution panel and a slot on the back top of the breaker to slide onto the positive bus bar post of the distribution panel simply line up the bottom of the breaker first then tilt the breaker up to secure the top half to the positive bus bar post grab the securing bracket that is taped inside the distribution panel and screw it into place with a screw from the Explorer's life 120 volt AC distribution panel wiring kit to the top of the breaker box part of the bracket will lay on top of the main breaker to help hold it in place then I begin stripping and crimping ferrules onto all the triplex wire ends for my Outlets again the ferrule crimping tool I purchased came with a pack of ferrules so I use those to clean up the wire ends and to prevent a short in the system ferals aren't a requirement so if you don't have any just twist the ends of your wires and make sure all the stranded wire goes in only one terminal to prevent a short in the system I focused on the green wires first which go into the ground bus far and the back of the distribution box and then the white wires that go into the neutral bus bar at the front of the distribution box focusing on one color at a time helps to stay organized then I stripped and crimped the black wires to feed into the bottom of their respective Breakers since only one side of the distribution box can be used for this application I purchased tandem Breakers which allows me to have up to eight total circuits since tandem Breakers are designed to allow two 120 volt circuits on the same breaker eight 120 volt circuits should be plenty for any van build these 20 amp Square D home tandem Breakers can be purchased separately from explorist.life the black wire ferrules will go into the respective breaker terminals on the bottom simply apply the ferrule and the terminal and fasten the screw lastly strip and crimp the six gauge insulated ferrules from the Explorer's life 120 volt AC distribution panel wiring kit onto the ends of the six three wires since I didn't have the right crimping tool for six gauge ferrules I decided to skip the ferrule and use the bare metal wire for my connection but if you have the right tool I definitely recommend using the ferrules provided again the green wire goes on the ground bus bar in the back the white wire goes to the neutral bus bar in the front and the black wire goes into the 50 amp main breaker now the distribution box and distribution panel lid can be screwed down with the hardware provided and the explores life 120 volts ac distribution panel wiring kit to start add screws around the perimeter of the distribution box and except for the four corners for the distribution Panel LED to sit flush to the distribution box remove some of the back covers on the lid where you have Breakers to do so I use the Klein 63030 coaxial cutters simply line the tool up on the crease and squeeze the black piece should pop right off now the lid will sit flush on the distribution panel box and the holes on the four corners of the lid will line up with the four holes in the corner of the distribution box apply the screws in each corner to open the lid push down on the little window and it will pop open giving visibility to the main breaker and each circuit breaker grab the label maker and create detailed labels for each breaker indicating what that breaker is powering now it is time to test a 120 volt AC circuit to do so I wired an outlet plugged in a phone charger to the outlet turned on the master battery disconnect switch turned on the multi-plus turned on the 120 volt 50 amp main breaker and the 20 amp 120 volt breaker for that specific wire run and we have power now that the 120 volts ac distribution panel is wired to the multiplus it is time to wire for Shore power for this section of the install I am using the explorerslife 30 amp Shore power wiring kit which includes 10 gauge Triplex wire three 10 gauge ferrules a 30 amp Shore power Inlet and a mounting hardware of four number eight by one inch stainless steel machine screws number eight stainless washers and number eight stainless Nylock nuts I also purchased the 30 amp Shore power cord and 15 amp to 30 amp adapter from explorist.life so first up for your Shore power is determining the location I know that I want to put it on the driver's side wall in the very back next to my electrical box so that the wires can easily feed into my electrical system that this will be housing so you got to make sure that you're considering both of what's on the inside of your van and the outside of your van meaning there's trim on the bat on the outside of your van do you want to drill through that there's flaps right here on the inside of your van you don't want to drill through or hit so you got to really make sure that you're choosing a good location so I've decided to put my Shore power right here and what I've been noticing is that this lift right here on the van that's above this black vent this is where the trim on the outside of your van stops and then you can feel a little bit indent as you go up more you can also see that indent on the outside of your van as well so I'm aiming to get it between that so it's on a nice flat and smooth surface as you've seen me do in previous videos I always use painters tape when cutting into the metal just so I can protect my band from these scratches from any paint peeling off and things like that so go ahead and tape up that area that you're going to be drilling your hole for your short power in foreign and like I mentioned earlier about the trim piece and The Edge on the inside of your band this is what I was talking to was this black section so where that lip is is this line right there so again I'm putting it above that but below this indent on the wall so right here I am using a 1 8 drill bit to drill from the inside of my van to start with a pilot hole exactly where I want the shore power reason I'm doing it on the inside is so I know that it's not going to be hitting or being obstructed by anything already on the inside of my van and I'm going to be holding a vacuum hose up while I do that hole just to catch any small metal shavings that are going to be created from this pre-drill so that it's not loose in my van causing rust now I'm going to tape a cardboard box to the outside of the van just to catch those male shavings when I go to drill with the whole and I'm also taping a box on the inside of the van again to catch those metal shavings metal shavings and this in your van are not good they will cause rust so you want to make sure that you don't leave any behind and they are so small that they fly around and they move around and then it's hard to clean them all up all the time so that is why I always tape boxes to wherever I'm cutting into the van just so I can try and catch those and eliminate them from going freely in the van so now I'm using a 2 and 7 8 inch hole saw don't forget to wear your glasses safety glasses and then drill away place the drill bit of the hole saw into the pre-drilled hole the drill bit in the middle helps to keep the hole soft When jumping around for a successful cut keep the hole saw straight and level with little to no movement and now I'm just using some double-sided tape to hold this up on the van right here so that I can drill the pilot holes for the screws that go into this and to make sure it's nice and level you can measure on the van so up to your trim piece there and right there and that'll also help you to get nice and squared and leveled open it and then you're going to pre-drill in those four corners with um an eighth inch drill bit and now you can take that off and then I'm going to use a metal file to clean up these sharp edges and now it's time for your Rust-Oleum stop rust clean metal primer and your Rust-Oleum stop rust protective enamel that I find easiest to apply with a foam brush keeping the paint here in the Box on the inside just to catch any drips that might happen so do the primer first wait for it to dry for 15 minutes and then do the protective now I'm going to remove the tape and the cardboard box on the inside vacuum up anything that might have fallen inside the van and then we're going to start wiring the short power another place I see people install their Shore power Inlet is here on the black trim piece on the van bumper this is where I wanted to install it originally but I kind of forgot about it and just installed it on the side of my van which isn't a big deal but if I would have done it on the trim in the back it Blends into the van more instead of standing out like it does on mine to begin wiring the shore power Inlet remove the retaining clip on the back cover it is secured with two Phillips head screws then feed the 10-3 wire through the back cover of the inlet next strip back two and a half inches of the triplex wire outer sheath and three quarter inch off the end of the three individual wires because ferrules won't fit into the shore power Inlet terminals twist the ends of the bare stranded wires to feed it into the respective terminals the terminals on the inlet are far enough apart that the chances of stray wires going from one side to the other causing a short is slim to none before adding the wires unscrew the three retaining screws on the side of the shore power Inlet to make sure the terminal is open to receive the wire now you can insert the three wires into the color-coded shore power Inlet the black wire goes into the black terminal white wire to the white terminal and a green wire to the green terminal to hold the wires in place re-tighten the three wire retaining screws on the side of the shore power Inlet if you have an impact driver the recommended torque spec for these screws is 20 inch pounds make sure there is no wire insulation in the terminals which would create a poor electrical connection from there Slide the back of the shore power Inlet up the wire the side with the retaining clip area will face down then re-fasten the retaining clip back into place now it's time to fasten the shore power Inlet to the van carefully feed the 10-3 wire into the hole you drilled from the outside of the van then add the four one inch stainless steel machine screws into the four corners of the shore power Inlet on the inside of the van add the washers and nylon nuts to all four screws and tighten the four connections an 11 32 inch socket worked for me as you can tell I did this part of the shore power install prior to permanently installing my electrical box so before moving the box into place I fed the triplex wire into its designated hole on the box now all that is left is to connect the other end of the 10 3 Triplex wire to the multi-plus so strip back about three inches of the outer sheath and then strip about half an inch of insulation on the three individual wires crimp the 10 gauge ferrules provided in the Explorer's life 30 amp Shore power wiring kit onto each wire end remove the left cable entry gland on the bottom of the multi-plus feed the bottom section and middle section of the cable entry gland over the 10-3 wires and tighten the two pieces together feed the three wires and cable entry gland back into the left Port of the multi-plus bottom remember to add the top disk of the cable entry gland over the wires and screw it onto the bottom half of the cable entry gland start by hand tightening the connection then carefully use a flathead screwdriver to tighten it further lastly feed the three wires into the respective terminals black wire to the line terminal white wire to the neutral terminal and green wire to the Ground Terminal tighten the terminal screws with a Phillips head tool to secure the wires in the terminals now the shore power Inlet is ready to be used turn on the master battery disconnect switch plug the 30 amp Shore power cord into your Van's Shore power Inlet and tighten the head of the cord around the inlet which secures the cord in place then plug the 30 amp Shore power cord into a 30 amp Shore power inlet at a campground if you are plugging into a standard 15 amp household Outlet use the 15 amp to 30 amp adapter to do so open The victron Connect app and turn on the multi-plus inverter charger now you should see the multi-plus start charging the shore power will charge your batteries and power the 120 volt loads running in the van any leftover power will go on to charge the batteries now that we can power our 120 volt loads directly from Shore power and charge our 12 volt DC battery Bank from 120 volt Shore power it's time to wire the 12 volt DC distribution panel here are the components for this part of the install the 12 volt DC distribution panel from explorers.life and the Explorer's life 12 volt distribution panel wiring kit which includes six gauge red wire six gauge black wire two six Gauge by 5 16 inch wire lugs two six gauge insulated ferrules one half inch red heat shrink one half inch black heat shrink a 100 AMP Mega fuse and the 12 volt distribution panel mounting hardware to start measure cut strip crimp and heat shrink the wires that go from building's distributor to the 12 volt distribution panel both the positive and negative wires get a six Gauge by 5 16 inch wire lug on one side and a six gauge ferrule on the other side between both wire locks with rubbing alcohol and a cloth to facilitate a better electrical connection make sure the master battery disconnect switch is off then remove the lynx distributor Hardware from a remaining negative bus bar stud connect the negative wire lug to the negative bus bar of the victron lynx distributor and replace the washer lock washer and nut and tighten the connection with a 9 16 inch wrencher socket remove the lynx distributor Hardware on the two studs above the negative wire add the 100 AMP Mega fuse to those two studs after wiping it down with a cloth and rubbing alcohol then add the positive wire lug on the lower stud that the fuse is resting on refasten the hardware on both studs going washer lock washer and nut then tie in with a 9 16 inch wrench or socket now stretch those two wires to the 12 volt distribution panel area for later and begin wiring the 12 volt branch circuit wires that you have run through your van as part of your pre-wiring strip back about eight inches of each wire's outer sheath and then strip a quarter inch of insulation from each individual wire the negative wires go on the negative bus bar and the positive wires go on the positive bus bar each positive wire gets its own terminal but the negative wires can share a negative terminal if needed I am not using ferrules on these wires because it adds too much bulk remember what Nate says ferals are a tool and not a requirement so if they're hindering more than they are helping they don't need to be used instead twist the wire ends and make sure each stranded wire is going in the proper terminal and fasten each Wire by screwing the terminal screw again make sure there is no insulation in the terminal which will affect the electrical connection now if you need help determining what type and gauge wire you need for a 12 volt Branch circuits check out my last video where I walk you through that process step by step also keep in mind that the thickest wire you can use in this distribution panel is 10 gauge wire then connect the negative and positive wires from the victron lynx distributor to their respective spots on a 12 volt distribution panel negative wire to the negative bus bar and the positive wire to the positive terminal at the bottom again I didn't use the six gauge ferrules because I don't have the proper tool but if you do definitely add the ferrules for those two connections then the 12 volts DC distribution panel can be screwed into place with the hardware and the explores life 12 volt DC distribution panel wiring kit now add the ATC blade fuses to the front of the 12 volt distribution panel and their respective terminals you will notice numbers along the side of each fuse holder which references the numbers on the back of the 12 volt distribution panel bus bars this will help you make sure that each fuse is going in the right place to determine what size blade fuse to use in the 12 volt DC distribution panel userexplorest.life fuse calculator that I have linked below you will need to know the amps of each 12 volt item you are powering off of your electrical system also note that this 12 volt DC distribution panel requires only ATC fuses I have linked the fuses I used below lastly grab the label maker and make detailed labels for each circuit to go on the lid of the 12 volt distribution panel the numbers on the lid refer to the fuse and bus bar numbers for reference Slide the 12 volt distribution panel lid onto the 12 volt distribution panel box to test the 12 volt wiring turn on the master battery disconnect switch and test a 12 volt circuit oh my gosh oh my gosh this is so cool now that we have wired the 12 volt distribution panel it's time to wire this system for solar charging this step will consist of three separate sections in this section we will be wearing the victron smart solar mppt charge controller to the victron lynx distributor here are the components for this part of the install the victron smart solar mppt 150 Solar charge controller that I purchased from battleborn and the Explorer's life victron smart solar and PPT 130 wiring kit which includes six gauge black wire six gauge red wire two six gauge ferrules three six Gauge by 5 16 inch wire lugs a 6 gauge by quarter inch wire lug two half inch red heat shrink four half inch black heat shrink a 60 amp Mega fuse and the victron smart solar mppt mounting hardware now for the remainder of the video you will see me wearing this 150 mppt charge controller but I have since purchased a larger mppt charge controller rated 150 45 because my solar panel wattage was too high for the 150. now I could have reward my solar panels and parallel and the 150 mppt charge controller would have worked but I didn't want to do that so I just upgraded to a bigger charge controller it is the same exact install process so back to the video to start measure cut strip crimp and heat shrink a six Gauge by 5 16 inch wire lug and a six Gauge by a quarter inch wire lug onto the ends of the black equipment ground wire that will connect the mppt charge controller to the multi-plus remember to clean the wire Logs with rubbing alcohol and a cloth connect the quarter inch wire lug on the equipment ground wire to the stud on the side of the mppt charge controller with a Phillips head tool in order of bolt lock washer washer wire lug serrated washer and charge controller next use the four 14 by three quarter inch pan head screws from the Explorer's life and PPT charge controller wiring kit to mount the charge controller in place now the other end of the equipment ground wire needs to be connected somewhere with a clear path back to the negative bus bar of the lynx distributor since all the spots on the lynx distributor are taken connect the equipment ground wire from the mppt charge controller to the bottom stud of the multi-plus you may recall we already wired an equipment ground wire to this stud when we were connecting the multi-plus to the lynx distributor so this stud will share the two wire lugs simply remove the nut lock washer and washer put the six Gauge by quarter inch wire lug from the mppt charge controller equipment ground wire on top of the equipment ground wire lug already on the stud and reapply and re-fasten the washer lock washer and nut with a 9 16 inch wrench or socket to finish wearing the mppt charge controller measure cut strip cramp and heat shrink the red and black power wires that will connect the charge controller to the lynx distributor both wires will have a six Gauge by 5 16 inch wire lug on one end and a six gauge ferrule on the other end wipe down the wire lugs with alcohol and a cloth to Aid in a strong electrical connection then remove the lynx distributor Hardware on the next set of three studs in the links distributor add the negative wire log to the negative bus bar of the lynx distributor and a refasten the washer lock washer and not with a 9 16 inch wrench or socket next add the 60 amp Mega fuse to the two studs above the negative wire after cleaning it with rubbing alcohol and a cloth add the positive wire look on the bottom stud that the fuse is resting on and re-fasten the washer lock washer and not with a 9 16 inch wrencher socket on both studs connect the other end of the positive and negative wires to the positive and negative battery terminals on the bottom of the mppt charge controller use a flathead screwdriver to secure the wire ferrules in the terminal now the victron mppt charge controller can be programmed turn on the master battery disconnect switch open The victron Connect app and click on the charge controller here you can change the settings to the recommended parameters for the battleborn batteries again since I bought this component from battleborn they have already wired the unit for me now that we have wired the victron smart solar mppt charge controller to the victron lynx distributor it is time to mount and wire the solar panels I have three 200 watt 24 volt monocrystalline rigid solar panels by Rich solar that I purchased from battleborn I also purchased three boxes of the rich solar Z mounting brackets from battleborn to secure the solar panels to my Flatline vanco roof rack each box comes with four Z brackets four bolts four nuts and four self-tapping screws the self-tapping screws are for if you plan on drilling the Z brackets directly to the roof of your van therefore I won't be needing them I also purchased a hardware kit from Flatline vanco to secure the solar brackets to the 80 20 crossfires that make up their roof rack the kit includes t-nuts lock nuts and bolts now normally you would take these brackets and attach them right to your solar panels and then attach it to a roof rack or screwing them into the roof of your van however I have three solar panels that are quite large and limited space on my roof so I had to get a little creative with it and I'm taking a different approach where instead I'm attaching these brackets to my crossbars first and then going to attach my solar panels so I get the most space out of the roof of my van to start I added the Flatline vanco Hardware to each Rich solar Z bracket all brackets get two sets of a bolt lock washer and t-nut the bolt and lock washer go on the top of the bracket and the t-nut goes on the bottom side of the bracket don't make the connection too tight so there is still room for the t-nut to slide through the 80 20 crossbar Channel to slide the bracket onto the crossbar line up the two t-nuts to the 80 20 Channel and Slide the bracket into place now like I said my roof setup is very unique and different and I have to accommodate a lot of stuff so I'm not going to go too into detail with how I'm doing this approach pretty much I needed to save as much space as possible so my solar panel you would think if it was going between these two crossbars that I would just use this Channel and that channel but I actually decided to use the opposite side channel to get that extra space and then for the see that back it's over there so it's kind of like back and forth I know it's not going to make sense but this channel then that channel for the that solar panel that channel for that solar panel and then that channel for that solar panel so I kind of broke it up that way just so I could save that space and really optimize my roof on the back of these solar panels you see you have attaching points on both ends and then the sides as well so to get these brackets secured in the proper location for this hole to go into the hole on the solar panel what I did was I took one bracket and I lined it up against this and got the holes where I wanted it to be flipped it over tighten this down did the same for a middle piece that has four brackets instead of two because this has two position end piece so do the same thing with this and then after I had those two I was able to just line up the ends to one another and then run the other two rails right next to it flush on both ends move the brackets to the appropriate location and then tighten it down with an allen wrench instead of having to line it up against the solar panel every single time um I don't know if you can see this but this is kind of like my visual of what I was doing um on since I'm connecting to the side of my solar panels there's one two three four holes on both sides so I'm gonna stagger it so I did that's how I was staggering it this is the left side of the solar panel that's the right side just so I could have that as a visual um just to put equal help and support along the solar panel so that's what I did now it's time for me to take this these crossbars flip it over on top of the solar panel line it up with the holes throw the bolts into it and then tie the nut onto it at the bolts and nuts from the rich solar Z bracket mounting box to the Z bracket on the crossbar and underside of the solar panel so once I got the crossbars lined up and the nuts and bolts Loosely installed onto each of the brackets I went around and used the scrap piece of wood to run it along the edge of the solar panel right there so that I would get the same overhang for my crossbar on both sides for all of the crossbar so everything was nice and equal and then I also took this and put it on solar panel to solar panel make sure that they were still nice and line and flush and everything squared nothing's crooked so that would be a lot easier to install on the roof after I got those positioned where I wanted it to I grabbed two wrenches and use one to hold down the bolts and use the other one to tighten the nut and now all that's left to do is to connect my wires now on the back of each of your solar panels you're going to have a positive and negative wire so to connect all three of my solar panels together I'm going to be connecting the wires in series which means I'm going to be connecting a positive wire to a negative wire a positive wire to a negative wire whereas the other option would be running them in parallel which means connecting positive to positive and negative to negative but take my word on this you want to run your solar panels in series I will be doing a future video we'll explain a little bit more why that is but I would not recommend running them in parallel you can it's totally up to you but I would recommend series now each application is going to be different for everyone so if you have space to connect them once they're on the van and install go ahead and do that route I know personally I'm going to have to connect these before I bring these up to my van just because I won't have enough clearance underneath to get there and connect everything um so yes connect them in series not parallel so both of the wires are labeled one is positive and one is negative the ends of these wires have an mc4 connector so this is the female connector and this is the male connector so the male goes into the female when you're connecting them and then you would just push them together and that's how you would make that connection so my wires for my solar panels are going to go through a cable entry gland through the roof of my van down towards my battery Bank area my electrical setup so I want my back most panel to be the last one in this connection so I'm going to start up here where the front panels are going to be and then we can go ahead and continue making those connections positive to negative positive to negative all the way until the last one so I took the positive wire from this one connected it to my negative wire of the middle solar panel took the positive of the middle solar panel and connected it to the negative of the N solar panel so now this end piece is going to get connected to an X wire extension with another mc4 connector that way that extra wire is going to run down into my van into my electrical and then this negative wire on this far one that hasn't been used yet will also be connected to another wire that's going to run down to into my van into my electrical system so that is how you wire them in series again I would recommend wiring in series instead of parallel but now it is ready to get this lifted onto the roof of my van with some help because this is very heavy and flimsy so um we're gonna get to that right now thankfully my two brothers helped me lift the panels up and re-fasten all the crossbars in place now you may be thinking why didn't she just add one solar panel at a time to the roof and let me remind you that the 80 20 crossbar channels cannot be accessed when they are secured between the roof rack side rails also like I said my setup is very unique so this gave me better access to connect everything as needed one thing I did change was I re-ran the solar panel wires under the crossbars instead of between the crossbar and solar panel to avoid the wires getting pinched down the road if the brackets happen to wear or fail also I added zip ties to hold those wires off the roof of the van and to secure it around the 80 20 crossbar so there wouldn't be any noise when driving and so the connections don't risk Coming Undone or breaking or what have you now the solar panels are on the roof and wired in series it is time to connect the solar panels to the solar isolator and the solar isolator to the mppt charge controller for this part of the install I use the Explorer's life solar array wiring kit which includes the solar isolator disconnect 10 gauge red wire 10 gauge black wire a 3 8 inch red heat shrink a 3 8 inch black heat shrink two 10 gauge ferrules four wire glands a roof entry gland a solar grommet a PV connector and solar isolator mounting hardware to start determine where you plan on mounting the cable entry gland to the roof of your van take into consideration any obstacles on the outside and inside of the van I noticed the cable entry gland is a little too wide for the ribs on the Pro Master roof so it won't fit in the Valley of the ribs therefore I decided to place it on top of the rib there is some slight overhang on both sides but I'm not too worried about it as I sealed it off later in the install I have also seen individuals who drill holes into this section in the rear of the van then they add entry glands and feed the wires through to the inside of the van personally I didn't do this because I felt like that was a long run for my wires to go from the solar panels into the van and would just make it more complicated but maybe that option would be better for you so just thought I would share so I've decided to put my cable entry gland right here underneath my solar panels that way it's hidden the van has a nice clean looking finish on the roof once I determine the location of the cable entry gland I went back inside the van to pre-drill a hole where the cable entry gland will be placed I pulled back my insulation put on my safety glasses and began pre-drilling a hole in the ceiling with a 1 16 inch drill bit I held a vacuum in the area I was drilling to immediately catch any metal shavings created to prevent them from going freely in my van and causing rust [Music] foreign before going back to the roof of the van I taped a box to the inside of the ceiling to catch any metal shavings that will be created when I drill a larger hole on the roof of the van and then I also need a box on the very top of the van when I drill as well just to capture again those little small metal shavings so to do that I took the box at the cable entry gland came in and I put it in this larger box and traced it out with a marker so now I'm going to cut it out with a box cutter and then tape this to the roof of the van then once back on the roof of the van clean the roof where you will be mounting the cable entry gland place the rubber grommet over the pre-drill hole and Trace the object with a dry erase marker so you have a reference when drilling with a step bit the dry erase marker isn't permanent and will easily wipe away off of the van metal tape the other cardboard box that you made for the roof of the fan around the traced Circle then make the pre-drill hole slightly larger so it can receive the step bit I use a 5 16 inch bit to do so next use a one inch step bit to expand the hole out to the traced line clean up the sharp edges with a metal file and vacuum up the metal shavings captured in the cardboard box to protect the newly exposed metal from rust add Rust-Oleum stop rust clean metal primer with a foam brush then wait 15 minutes for that to dry before applying the Rust-Oleum stop rust protective enamel with a foam brush I left the boxes on the roof and the inside of the ceiling in place to catch any drips from this step once the paint has dried the opening is ready for the rubber grommet using scissors poke a hole in the center of the rubber grommet so the solar wires can be fed Through The Grommet and into the van add the rubber grommet to the hole the metal of the van will rest in the center splice of the rubber grommet this grommet protects the solar wires from getting cut on the sharp edges of the Vans metal go back inside the van feed the black and red solar wires from the Explorer's life solar array wiring kit through the rubber grommet then climb back up to the roof and add 3M double-sided VHB tape to the perimeter of the cable roof entry gland bottom trim off any excess and remove the back of the double-sided tape next add the solar wires into the roof entry gland and push the roof entry gland into place on the roof of your van make sure the two grommets on the cable entry gland are facing the back of your van so no water or wind is forced in the van when you are driving now tape off about three quarters of an inch around the outside of the roof entry gland and use some sycaflex sealant around the edges of the roof entry gland on the flange of the roof entry gland and out to the tape to secure the gland to the roof and seal it off from any outside elements it will encounter like water you will see here I am applying the Stick of flex with my fingers and no I do not recommend this whatsoever unfortunately the tip of my sticker Flex was all dried up from the last time I used it so instead of buying another tube which is really expensive I made what I had work the student can be very messy so if you get it on your hands be aware anything you touch will turn black an all-purpose cleaner can remove it if done so before it dries now be generous with this sealant to avoid any leaks in the van it won't be visible anyways so stick a flex away after applying the sealant peel up the tape immediately after now that I have the wires for my solar isolator inside the van coming up through the cable entry I need to now put mc4 connectors on the ends of these to connect to the mc4 connectors on my solar panels so mc4 connectors are these right here a majority of solar panels that you get they will come on your solar panel so there's going to be a male and a female end this one is the male and then this one is the female which is pretty self-explanatory the male goes inside of the female and then also when you're installing these you're going to have these connectors that are going to be going inside of them so there's also a male and a female connector the male connector is slightly smaller in diameter and the female connector is slightly larger again so the male can go into the female now the confusing part is that the male metal clip connector goes inside the female mc4 connector and then the female connector goes inside the male mc4 connector so the reason that I'm using mc4 connectors not only is it because it's already on my solar panels but they're also waterproof UV resistant and they are quick and easy to connect and disconnect and they can carry a Max load of 20 amps and 600 volts and another thing to note is if you're using mc4 connectors they only take a 10 gauge wire generally speaking the male mc4 connector is positive and the female mc4 connector is negative you can always double check this by placing the multimeter into the mc4 terminals reminder if the multimeter display number has a negative sign in front of it then that is indicating reverse polarity so switch the multimeter prongs and the mc4 connectors to get a number without the negative sign and that will tell you which connector is positive and which is negative so let's get to connecting them to start strip back the installation on the positive and negative solar array wires coming from the inside of the van so now I need to determine what mc4 connector goes on which ends so this is a wire coming from my solar panel it is the positive wire so I need to connect my positive wire to positive so since this mc4 connector on my solar panel is male that means I will be connecting my female mc4 connector to this wire which means I will be using the male metal connector on the inside so I went ahead and I just placed the male connector for the positive wire and they're just nice and Loosely so then once I feed this wire into there I can just go ahead and squeeze the handles and crimp it down again making sure that no straight wires are left out these in that you're putting the sides with the flaps facing up um right there on the top part right there you see those little ribs so the flaps were facing that way so that when you squeeze it they crimp down nicely like this and you want to make sure that's really good and snug on there by pulling on it pulling on The Wire pulling on the connector pulling with all of your might and if it doesn't come off you're good to go so now that the male metal inside connector is on my positive wire I'm going to take my female mc4 I'm going to unscrew this bottom piece slide it on The Wire have this blue piece in there for a seal you're going to put it in here and when you push it you should hear it click when it's on there all the way so let's go ahead there so that clicked hopefully you guys heard that but you can see inside that you should be able to see that connector once that is on you're going to take this and tighten it once you get to a certain point about right there you're going to feel that it gets hard to turn that's because as you're turning right now what it's doing is here I'll show you on the male connector is that it's folding these teeth Inward and pinching it inward to pinch that blue piece and to pinch the wire in place so you can get tools that will help you to turn them you can also do it by hand or with a ratch a wrench or anything but you want to make sure that there is no Gap right here so as you can see the mail on my solar panel is going to go into the female um from The Wire going down to my stroller isolator just like that you're going to hear it click right there there's two um points right there it clicks in so if you want to release it you just pinch those in and pull it apart but otherwise you can test it make sure it's not going to come apart and then you are all good to go so now it's time to make the same connection on my negative wire to connect to the negative solar wire as well so I'm going to add the female middle connector onto the end of this negative wire then I'm going to crimp it and crimping down on those two flaps a squeeze really tight make sure you've got that full squeeze and then there you go pull tug make sure it's not going to come off so now you're going to take your mail and mc4 connector taking the bottom part of the cap that screws on and putting that on first and then putting on the mc4 connector and pushing it all the way down until you hear it click or at least feel it click here we go oh perfect I hope you guys heard that one and then you're gonna screw this shot again the easiest screw in the beginning but once you hit a certain point you really got to start cranking it so now I just need to get my negative wire all the way on the last solar pin all the way up in the front feed this to it and then our solar panels are connected and good to go now the wires can be connected to the solar isolator before doing so make sure the master battery disconnect switch is turned off grab the solar isolator and unscrew the lid to access the inside of the unit then remove the bottom two plugs with a flat head screwdriver insert the wire glands from the explores life solar array wiring kit into those two openings and tighten the components together you may recall the Explorer's life solar array wiring kit includes four entry glands this is because the solar isolator can handle two separate solar arrays at the same time so those two extra wire glands can be used on the other two ports at the top of the solar isolator but if you're using just one solar array like I am you'll just have an extra two wire glands left over next Mount the solar isolator in place with the mounting hardware provided in the explores life solar array wiring kit then measure cut and strip the positive and negative wires coming into the van from the solar panels to feed into an entry gland of the solar isolator I have my positive and negative wear coming into my electrical box from the solar panels fit it up through this cable entry gland and then put it into those terminals right there tighten the screws so that they're holding in place didn't use ferals wasn't necessary for this and then on the top side I took the solar wire cords that I cut so the ends of that and again I stripped the wire and inserted them into those terminals as well so positive is in this terminal and positive is in that terminal terminal on the bottom so it's on the same exact line and then again the same thing with the negative negative to negative now I'm just going to bend these wires and run them along the side of the solar isolator out this other out this cable entry gland to my mppt charge controller and then I'm going to just screw the lid back on and that should be good to go the solar isolator has four terminals on the bottom and the top so use the same terminals on the bottom and and top of the solar isolator when connecting a positive to a positive and negative to negative then strip crimp and heat shrink the 10 gauge ferrules onto the other end of the wire that will feed into the charge controller terminals the positive wire goes to the PV positive terminal and the negative wire goes to the PV negative terminal tying each terminal screw with a flat head screwdriver now that the solar isolator is wired to the solar panels and mppt charge controller go ahead and turn on the master battery disconnect switch and then a solar array isolator park the van and the sun open The victron Connect app click on the charge controller option and you will see that the system is indeed charging if you don't see a charge here it could mean something is wired wrong or more than likely it means that the batteries are fully charged so the solar panels won't charge the batteries until they drain a little or it is super cloudy out or you're parked in a lot of shade or it's night time and no sun is out to power the solar panels now that we have wired for solar charging it's time to wire for alternator charging for this part of the install I am using the victron Orion 12 12 30 DC to DC charger that I purchased from battleborn and the explores life Orion DC to DC charger wiring kit which includes six gauge red wire six gauge black wire 4 6 gauge by 5 16 inch wire lugs four six gauge ferrules four half inch red heat shrink four half inch black heat shrink a 60 amp Mega fuse and mounting hardware first make sure the solar or disconnect switch and battery disconnect switch is turned off then screw the Orion in place with the four screws provided in the Explorer's life Orion DC to DC charger wiring kit next tape the green remote Bridge from the Orion box to the Orion for safe keeping to install later now measure cut strip crimp and heat shrink the positive and negative Warriors running from the Orion to the lynx distributor each wire gets a six Gauge by 5 16 inch wire lug and a six gauge ferrule then wipe down the wire lugs with rubbing alcohol and a cloth for a better electrical connection remove the lynx distributor Hardware on the remaining studs add the negative wire to the negative bus bar in the links distributor and refasten the washer block washer and not over the wire lug with a 9 16 inch wrencher socket add the 60 amp Mega fuse to the positive bus bar stud and middle stud below that at the positive wire lug to the lower stud that the fuse is resting on and reapply the washer lock washer and nut onto both studs with a 9 16 inch wrencher socket now you can connect those wires from the lynx distributor to the Orion negative y referral to the negative output terminal and positive wire ferrule to the positive output terminal of the Orion tightening these connections with a flat head screwdriver next strip crimp and heat shrink a six gauge ferrule onto one end of the positive and negative wires that will run from the Orion to the Vans battery the positive wire referral goes into the positive input terminal and the negative wire ferrule goes into the negative input terminal of the Orion tighten these connections with a flat head screwdriver so now you're going to connect the two wires from the Orion all the way up to the Vans battery situation which is located here on a Ram ProMaster if you're working on another make and model like a Ford Transit or Mercedes Sprinter this step is going to be a little bit different but if you are in a Ram ProMaster you can follow along here so in order to run the wires all the way up through into this battery situation right there I am running it through the toe kick side by Cabinetry and then I also need to remove a lot of this plastic interior to also run it underneath all of this flooring so to do that I removed this section right here there's one two three screws that will remove it because this is overlapping on top of this which we need to remove I also need to remove this section right here so there's one two um screws right here on it and then I think believe three of them in back there that you also want to do and then you also need to undo this section on your driver's seat so one two three screws and then at that point you can go ahead and remove this whole step area so to do that there's three screws right here you're going to take a flathead screwdriver and pop up these tabs one two three and four which you'll be able to access once this is removed and there's also a screw underneath each of those that you undo and then this whole floor area is going to be exposed and you can run your wires through there and feed it into this battery situation which you just simply undo this section by undoing some of the tabs that go around the perimeter of this cover so right here on the step area of my Ram ProMaster there's these clips that were installed for wires like these right here and stuff so I just open those clips and through my positive and negative wire in there as well and then I ran it up underneath this floor on top of these wires I went ahead and put Conduit on protection into my wires it's time to get these to connect to this whole battery situation again which is where your feet will be in the driver's seat area so this right here is covering your positive area of the battery so to undo it you just need to take these two tabs right there and pull it back towards you and then you can remove the cover like that you'll see all these fuses and stuff so before we do anything and connect these wires to this situation it is very very important that you undo this negative battery situation right here so to do that you're going to take this the thingy I don't know what to call it you're gonna take that and fold it open you're going to undo that nut remove this black wire make sure you get it out of the way so there's no chance that's actually going to fall into here when you're working on the situation you want to do this so that you don't set off any alarms or lights or airbags or deposit anything wrong with the van itself so I'm using a 10 millimeter wrench to remove this nut right here okay take this off and set it aside somewhere it's not going to actually fall back in and hit something in here because that would be bad so now we need to remove this entire compartment that's over the positive side of your van's battery so to do so you're going to release this nut right here with a 10 millimeter wrench which is going to release it off of this positive battery terminal then you also need to remove these two screws on the doohickey with a Phillips head tool and then at that point this entire section is going to lift up then we can feed the bolts up through those two holes provided add our fuse wire lugs and then secure everything back down so now you're going to feed two bolts up into those two openings so that you can create your own stud to attach the fuse and wire lug too now you will notice that these openings for your bolts are square head shaped you have to get square head shaped so that when you put this back into place and you go to tighten down the bolt over your fuse and whatnot it the head of the screw won't be able to spin so you can actually tighten the connection if you did a circle then that bolt is just going to keep spinning and it's not going to be able to tighten down whatsoever if that makes sense so here's the bolt that I'm referring to and that I will be using I have linked them down below because I could not find these for the life of me at Lowe's Home Depot or any hardware stores so they are linked below so you can get them through Amazon but it's really critical that you get them 5 16 inch 18 thread an inch long and a half inch by a half inch square head no longer than an inch long otherwise that red cover is not going to fit back over top of this so feed those two bolts up into here and then you can put this back into place and then continue from there you want to use a nylon nut and there again the nylon nut is a 5 16 by 18 thread so the reason I'm putting the nuts on top of these two bolts not that they're going to stay there it's just so that the bolts don't fall out while I'm trying to get this whole thing repositioned back on the battery so once I do so I'll be able to take these off but I'm going to go ahead now and go ahead and put this back into place so you want this ring right here to go around this battery terminal and then this doohickey these red prongs are going to line up with those two holes right there as well and then you can go ahead and tie in this nut again with the 10 millimeter wrench and then Phillips head tool those two screws back into place now that that is back in place it's time to cut this red wire to length so this red wire is going to be connecting to this stud or this bolt right here put it back in a place like this you will notice that there's a little window right there which is perfect so your wire can feed right into there sometimes I see people trying to run the wires up through here and whatnot and bend it around but I don't want it to get pin strength thing so I don't know maybe since my van is a different year that that's an option there so I'm going to feed it in through that little section right there now measure cut strip crimp and heat shrink a six Gauge by 5 16 inch wire lug then wipe down the wire lugs with rubbing alcohol and a cloth for a better electrical connection so now I'm going to take my half inch socket and undo the nylon nut on both of those bolts that we put in so that I can add the fuse and wire lug to it accordingly so I'm putting two washers on this leftmost stud because they'll help lift it to be even to that height then I'm adding a 60 amp Mega fuse onto these two bolts just like so now I'm going to add this wire log onto this post right here flat washer washerides and then a lock washer then a 5 16 inch lock nut that I'm going to tighten down with a half inch wrench and socket now you can put the cover back on so the two Tabs are facing the middle of the fan foreign now it's time to cut strip crimp and heat shrink on a six Gauge by 5 16 inch square lug onto the negative wire which is going to connect to one of the studs over here on the negative side of the battery and it might spark here when you add it so just be aware of that so I'm adding an M6 nylon nut over this stud and I'm using an M10 socket so now I'm going to add some of this hard shelled split Loom right here along the edges at this negative wire is rubbing up against the sharp metal edges of the van so I'm going to open it up feed the wire into it and then put some electrical tape around it to hold it in place and now I can re-add my negative van wire you might see Sparks when you touch it but there it goes and then retighten the lock nut that was originally on this stud again with a 10 millimeter socket and then you can go ahead and take this and close it shut to tighten what that does is it's tightening this whole component around this negative battery terminal we can go ahead and put the cover back over the floor and the last thing to do is take this green piece that was provided with the Orion and you're going to install it underneath and now I can turn on the master battery disconnect switch which would then allow you to connect to the victron Orion and The victron Connect app but I didn't realize mine does not actually have the Bluetooth capability but if yours does click on the victron Orion update the firmware if necessary and change the parameters to match your system and turn the Vance engine on after about two to three minutes of the van running you will see that the Orion is indeed charging but if you want to see the charging rate go to the BMV option in The victron Connect app and you should see somewhere around 30 amps of positive charge so if you haven't caught on yet this Orion allows you to charge your battery Bank when you are driving it only pulls 30 amps from your Van's alternator so that it doesn't kill your Advanced alternator at a quicker Pace over time not the entire electrical system is wired and working properly let's quickly cover a few wire management tips for a safe and clean install number one make sure all your electrical components are screwed down and secured in place having components loose can affect the connections over time be a safety concern and make it challenging to service the system number two use zip ties to coil up extra wire and to connect multiple wires together to clean up the entire system number three use rubber wire clamps to secure wires to the walls or floors so wires can't move around freely number four use split Loom with electrical tape and rubber grommets to protect wires when running through the sharp metal edges of the van I have linked all these items Below in the description box for you to purchase [Music] foreign [Music] [Music] with that I hope this video gave you the confidence and knowledge you need to install your own electrical system with the explorest.life all-in-one wiring kit tune into my next video where I will provide an explanation on how this system will function until then thank you for watching and I'll see you next time bye for now [Music] thank you"

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"VideoID": "501",

"Title": "PAANO MAG-ABANG NG UTILITY BOX SA CONCRETE WALL PARA SA OUTLET | Pinoy Electrical Warrior",

"URL": "https://www.youtube.com/watch?v=Lnnzl5d0lRU",

"Keyword": "Electrical wiring installation",

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"VideoID": "502",

"Title": "Understanding Different Types of Electrical Wiring | Types of wiring | LynxE Learning",

"URL": "https://www.youtube.com/watch?v=BIRS34UnsCo",

"Keyword": "Electrical wiring installation",

"Transcript": "electrical wiring a network of wires drawn connecting the meter board to the various energy consuming loads like lamps fans refrigerators Etc through control and protective devices for efficient distribution of power is known as electrical wiring electrical wiring is a process of connecting cables and wires to the related devices such as fuse switches sockets lights fans Etc to the main distribution board it is a specific structure to the utility pole for continuous power supply domestic wiring electrical wiring done in residential and commercial buildings to provide powerful lights fans and other domestic appliances is known as domestic wiring in the house after passing through the meter the main fuse and the main switch the wires are taken straight through the house note this system should only be used in small buildings as it is impossible to divide up the single Mains for testing purposes wiring materials electrical wire is made of materials like copper aluminum and silver but silver is expensive so copper and aluminum are mostly used in wiring materials are classified into three types according to their properties conducting material copper it is a good conductor of electricity it is used in wiring materials in cables it has low resistance and is used for conduction of electricity at high medium and low voltage aluminum it is lightweight and cheaper in comparison to Copper it is silvery white in color and it has a soft texture insulating materials insulating materials are used for insulating purpose these types of materials are bad conductors of current for example rubber paper Mica wood glass and cotton semiconductor material the elemental semiconductors are those composed of single species of atoms such as silicon germanium and tin in column 4 and selenium and tellurium in column 6 of the periodic table types of wiring electrical wiring system is classified into five categories cleat wiring casing wiring baton wiring conduit wiring concealed wiring let's discuss them in detail cleat wiring in this type of wiring insulated conductors usually vir vulcanized Indian Rubber are supported on porcelain or wooden cleats the cleats have two halves one base and the other cap the cables are placed in the grooves provided in the base and then the cap is placed both are fixed securely on the Walls by 40 millimeter long screws the cleats are easy to erect and are fixed 4.5 to 15 centimeters apart note this wiring is suitable for temporary installations where cost has the main criteria but not the appearance we can Now understand the advantages and disadvantages of cleat wiring advantages cheap and easy wiring easy to detection faults easy to repair alteration and addition is easy easy installation materials can be retrieved for reuse flexibility provided for inspection modifications and expansion relatively economical as skilled Manpower not required disadvantages bad appearance exposed to weather will be affected by humidity rain smoke sunlight chances of shock or fire only used in 220 volts in low ambient temperature not long lasting appearance is not good an open system of wiring requires regular cleaning higher risk of mechanical injuries casing wiring material used in casing wiring vir or PVC insulated wires casing enclosure made of wood or plastic made of wood or plastic procedure of casing wiring this kind of wiring is very old-fashioned generally PVC or vir insulated wires are carried through the casing enclosure and capping is used to cover the casing advantages and disadvantages of casing wiring advantages cheap and easy to install and durable wiring customization can be done easily safe from smoke dust rain and steam disadvantages very costly not suitable for weather with high humidity and acidic conditions insects like termites or ants can damage wooden casing and capping high risk of Fire baton wiring pattern wiring is one of the basic wiring methods that is used today it is also called as CTS cable Tire sheathed or TRS tough rubber sheathed wiring here insulated wires are run through the straight teak wooden battens these are fixed on ceilings or walls with plugs or screws the cables are fitted onto the patterns with tinned brass link clips that are fastened on with rust resistant nails some of the advantages and disadvantages of baton wiring are advantages easy installation cheap in material cost appearance is better customization is easy less chance of leakage current easy installation and is durable lower risk of short circuit cheaper than casing and capping system of wiring disadvantages not suitable for outdoor wiring humidity smoke steam Etc directly affect wires heavy wires are not recommended for this wiring scheme only suitable for voltage below 250 volts high risk of Fire danger of mechanical injury hence should not be used in workshops skilled workmen are required conduit wiring in this system PVC or vir insulated cables run through mild steel or PVC pipes called conduits providing good protection against mechanical injuries and fire due to short circuits they are supported over the walls and the system is best suited for domestic and Commercial installations advantages no risk of fire and good protection against mechanical injury the lead and return wires can be carried in the same tube a thing and continuity is assured waterproof and troubleshooting is easy shock proof width proper earthing and bonding durable and maintenance free the safest wiring appearance is better no risk of fire or mechanical wear and tear no risk of damage of cable insulation safe from humidity smoke Steam long-lasting disadvantages requires skilled workmanship erection is quite complicated and is time consuming risk of short circuit underwear conditions due to condensation of water in tubes very expensive installation is not easy not easy to customize for future hard to detect the faults concealed wiring same materials are used in concealed wiring as conduit wiring concealed wiring is properly named as concealed conduit wiring it is very laborious to install the layout of this wiring is done under the plaster of the wall of the building conduit pipes are buried under the plaster of wall with GI wire inside after with the help of GI wires the main PVC insulated cables are drawn through the conduit advantages and disadvantages of concealed wiring are same as conduit wiring wiring system at home the main Supply is delivered to houses using a three-core wiring called alive the neutral and the Earth these wires Supply electricity to separate circuits within the house the live wire and neutral wire coming from the electric pole enter a box fitted just outside our house the Live Wire has a potential of 220 volts and the neutral wire carries zero potential the two wires then enter the electricity meter which records the electrical power consumed by us in kilowatt hour these two wires coming out of their meter are then connected to a main switch and distribution centers which is placed in a main circuit box from Distribution Center wires drawn to distribution boards and from the distribution boards to various components like electric bulbs fan television refrigerator Etc the distribution circuits are always connected in parallel combination note in a parallel circuit if a fault or short circuiting happens the particular Distribution Center shut off and prevent the circuits from failing factors affecting wiring system durability type of wiring selected should conform to standard specifications so that it is durable that is without being affected by the weather conditions fumes Etc safety the wiring must provide safety against leakage shock and fire hazards appearance electrical wiring should give an aesthetic appeal to the Interiors cost it should not be prohibitively expensive accessibility the switches and plug points provided should be easily accessible there must be provision for further extension of the wiring system if necessary maintenance cost the maintenance cost should be minimum mechanical safety the wiring must be protected against any mechanical diamond or more sign up to www.linksy dot in"

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"VideoID": "505",

"Title": "Installing Rough In Electrical Wiring | Bedroom Remodel",

"URL": "https://www.youtube.com/watch?v=EYcXtWHMKqw",

"Keyword": "Electrical wiring installation",

"Transcript": "in this video we're going to run some wire and we're going to do it right now [Music] so here we are in my bedroom Remodel and it is time for wiring now let me start this video out by saying I am not a professional electrician I live in Massachusetts where I am lucky enough as a homeowner to be able to pull my own permit and do my own electrical so this is not going to be a how-to video this is more like a how I video this is how I am going to run my wire you may see some things in here that maybe a professional electrician won't do that's fine I'm gonna do my best to do this up to code and an inspector is going to come out and he's going to say yep you're good to go or no you did this wrong so any information that you get in this video you can do with what you please but again I am not a professional electrician I'm just doing my own and I'm showing you how I did it and if you are a professional electrician let me know how I do let's get to it so here is all the electrical goodness that I'm going to need I am running 14-2 for most of this bedroom you may have noticed in my kitchen I ran this yellow wire and the difference between them is that's 14 gauge wire and this is 12 gauge wire to determine which one you need there are codes for it that tell you what you need but also it depends on what you're going to be using if I was running this say to my basement where I use a lot of power tools I would be running this 12 gauge wire the thicker wire on a 20 amp breaker the kitchen for instance you need 12 gauge wire for a microwave for refrigerator and in fact a lot of kitchen appliances pull a lot of power so that's why they want you to use this 12 gauge wire however in the bedroom 14 2 should do just fine all that I'm going to be having in here are a couple outlets and no heavy machinery or anything like that a couple lights and I am going to do some smoke detectors as well so for the wire I'm going to use 14 2 I have right here 14 3 and the two and the three what that means is this one this is 14 3 this has three wires a black a white and a red and then a ground in my case I'm going to be using it for the smoke detectors 14 2 only has two wires the neutral and the hot and then a ground so I'm going to use that for all the outlets and everything then I run it up to the smoke detectors and then in between the smoke detectors I run 14 3. so that's it for the wiring and this is what I'm using for boxes just these simple plastic nail-on boxes for the interior walls and then for the exterior wall I have these energy saving boxes that have this foam on them which are actually required by code I have these old work boxes I did a whole video on Old work boxes but essentially These Wings hook up to existing drywall I'll use those for the smoke detectors this is a low voltage box I'm going to use this to run a cable wire in here and then I have all kinds of other goodies my lights my wire nuts wire strippers Staples Etc the first thing I did for this process is I ran an extension cord down to some power in the basement because I want any existing electrical to be removed like this really Old Wire BX is apparently still a great kind of wire to use but that is really old and trust me it falls apart when you start taking it apart so I want that gone I have this line that goes up into the attic I want that gone there's an old box right there that's going to be gone and replaced with new and over here I have this which was basically the end of the run or the beginning of the Run for the bathroom and when I redid the bathroom I just ended it right here and actually I ended up running a new wire right here and that new wire is going to be the one that feeds this entire bedroom so if you look downstairs you'll see that this is the line that goes up to the bedroom and over here is my panel so it's real close to the bedroom in fact the bedroom is right above here actually my panel is not looking half bad at this point there were a lot of old wires in this thing and there were a lot of wire nuts extending wires inside of the panel and a lot of this is new so I'm feeling pretty good about my panel in case you're wondering every new circuit that I've been putting in are arc fault slash ground fault combination Breakers so any new circuit that I put in any of these that have the white sticker those are all new and that is what I will be putting in for the bedroom I believe that top 15 amp breaker is for the bedroom but I don't have to do anything in the panel for this video that comes at the time of finish but that wire that goes up to that outlet is my starting point I know that that is where I'm getting the power from typically the first thing I like to do is to remove all the old wire and all the old boxes but since there's really none in my way because there was none in here I'm not going to worry about that until during or afterwards so the first thing I'm going to do is nail on my boxes so I know where to run my new wire these boxes are super easy to install they just have nails that you nail into the stud some have screws on the inside and you basically just hold it up against the stud and hold those tabs against your 2x4 or 2x6 whatever you have and nail it in place these tabs actually hold the face of this out to 3 8 of an inch typically drywall is half inch and you want this set back just a little bit you definitely don't want the box to be further out than your drywall because then you're going to have problems where you might have to cut the box down or do some fancy stuff with your mud and you don't want to have to do that on the reverse side of that if you set it too far in you shouldn't have a problem here but be careful with newer studs because newer studs have this curve and I think that's been my downfall in the past where I've just held them there by feel and they're actually sitting past the face of the stud so you need to hold it like this so I in the past have held them too far in this way and have had to use an extender on the face of this so you should be okay if you hold this with the face and just so you know these lines right here are all indicators of different depths of drywall the first one towards the top here is quarter inch then it goes 3 8 then half inch and then 5 8. if you didn't know that before now you know but again you want to hold it about 3 8 for a half inch drywall so are these marks even useful what do you guys think so I'm starting on this wall I'm going to leave that outlet for now leave that alone but eventually I'll shut off the breaker disconnect that line and bring it back up to wherever my box is and as far as choosing where to put a box I like to put more than I need but I believe the code is every 12 feet and no more than six feet from a corner so if you look here five feet is right here and then from this corner five feet is right here so if I put my box here I will be less than six feet so I'm gonna do one right here and I might put two if it made sense but I think that's a little much plus the door right here I'm never going to have a piece of furniture or anything right here so this one box should be fine for this wall as far as the height I just measure the other boxes in my house and if it's off a little bit it's fine just try and make them the same throughout the room and I'm going to go 18 inches to the top of the box and I'll do that with all of them that's it this wall is about 12 feet wide I'm going to do two boxes one on this stud and one on this stud foreign I have to move this insulation energy saving boxes required by code be careful don't break the Box but make them tight should wear gloves when you touch insulation it can bother your skin now this wall I am going to put one box as well but looking around the room and thinking about it I think this is the best candidate for where a TV would go either Center of this wall or in the corner so I'm also going to put a low voltage box right here so I can run cable right in the center of this wall or at least somewhat Center on those studs since this is a two by three wall I actually had to get a different box a smaller cubic inch box and on this wall I'm going to put one right there in the middle of this loosey-goosey stud this will feel good on my knee ow just kidding go okay so we got power coming up and then box here box there box there cable and box there now I'm going to figure out where to put my lights let me show you what I like to do I like to draw out the room on something like a piece of paper or something that I'm not going to lose this is harder to lose than a piece of paper besides this will be in the room for a while so I like to draw the the room this is the ceiling I'm going to do four lights one two three four not to scale now I figure out where I put those lights and then I mark on here from the walls where they are to the center and then I'll know when I hang my drywall where to make the holes I'm going to use recessed lighting in here that's just a personal preference I like to put recessed lights on a dimmer switch so I can have really low light or have it be really bright in here and I've done it in my dining room living room and my other bedrooms so it's going to match the rest of the house I'm going to use these Halo ultra thin down lights these are six inch these are really cool I will talk about these a little later in the video but as far as placement and the number of Lights there's all kinds of formulas online all kinds of information out there I'm just going off of experience when it comes to the number of Lights I think six would be too many for this room and I think four will actually be perfect but there is a pretty cool formula that I will show you how to determine the placement of these lights a lot of information out there again if you don't want to do it this way feel free to do your research so this is the formula I use and there's a little bit of math here so if you don't like math you can skip ahead but this is pretty cool you take the distance of each wall so the distance of this wall is 150 150 inches and then this wall right here on both sides is 113. so now you have the number of lights that you want so you take the number of lights that you're using in this row I'm using two you double that and then you use that number four you divide 150 by 4 and you'll get 37.5 that 37.5 is the distance right here to the center of the light off of the wall 37 and a half inches or 37.5 so same over here 37.5 then if you take that number and you multiply it by 2 you'll get 75 that should be the distance in between the lights 75 inches from Center to Center the same goes for this wall 113 you divide that by the number of Lights in this row times two so four 113 divided by 4 28.25 or 28 and a quarter so now right here here to here this distance should be 28 .25 or 28 and a quarter to the center same thing from here to the center and then same thing 28.25 times 2 is 56 and a half or 56.5 that should be the distance from Center to Center in between the lights so that's the formula I use like I said lots of information out there if it doesn't work out for you you can do whatever you please but this is where these lights are going to go so if you take a look at the ceiling I put some masking tape here and that X represents where a light is going to go there's those two and then right here and right here so if you can get the shot of the entire ceiling they're spaced out pretty nicely so now I want to talk a little bit about the Halo ultra thin down lights these are six inch they have selectable colors so you can change the Kelvin or the temperature to suit your preference or match the rest of your house I installed these in my kitchen and they really are ultra thin I fit them into impossibly tight spaces and that is the real big thing that I love about these so I'm gonna take them out of the box just to show you I mean look at that so you have the light itself this one has a textured lens which helps with distribution of the light and you'll follow this wire and you'll see that there is a box some holes on the back I'm going to attach this to the joists and basically you open up this box you put your wires in here and you strip the ends and you push them into these quick connectors right here and you're done and this is where you select the color so I am going to install these and then that way I can actually tie all the wires in here and the only thing I have to do is cut the hole out after the drywall is up and connect this right here just pops off and pops on easy peasy so just to show you here's what I was using before you can see how much clearance this needs compared to this these are both canless lights which means before these you had this big housing that had to be certified to be able to put insulation around it and then you got these which required no housing that were safe for insulation and then you have these which you can put virtually anywhere so I'm going to be using these and I got one for the closet as well this one just has a smooth lens a little less expensive and these are not expensive actually this is cheaper than if I was going to put a regular light in and it's an easy install so yeah love these lights highly recommend them I'll leave a link in the description where you can buy them so all I have to do is make sure I have plenty of wire I want to mount that probably about here and that's plenty that'll be good that'll be perfect they also have different a bracket like this you can use this bracket too I'm going to set these all to 3500 Kelvin two clicks that way and if I have to I can take them down they're real easy to take down and I can sneak in here and change them so I'll put the switch in a location where I can get to it pretty easy [Applause] one two thirty five hundred [Applause] one too clicky so obviously these lights are in a spot where I don't have to take advantage of the fact that these are ultra thin I do like that I can just hook that up and hook all the wires up and then just have that one connection to make after the drywall is hung but for the closet I have a piece of strapping right here that is going to interfere and normally I would cut that out in preparation of a recessed light but I don't have to because it will go right over that pretty cool don't have to worry about it so we're probably about 20 minutes into the video and we're finally ready to start running the wire and the way I like to do it is in a very linear fashion it makes sense in my head and what I mean by that is I know my wire is coming up from the panel to this Outlet so from this Outlet I'll run to my next Outlet it's very easy to connect the hot and the neutral from one wire and the hot and the neutral to the next wire that goes to the next Outlet tie the grounds together hook it up here and keep going like that and then go to the switch and then from the switch go up to the lights that makes sense to me some people will go to the lights and bring it down here and I don't like doing it that way because I know if I run it this way I will always hook it up where I don't have to flip the hot and the neutral or do any of that I don't mind using a box like this as kind of like a junction box to split the hot and send it out to another outlet but I don't like running it the lights first coming down here flipping hot and neutral it just doesn't make sense to me and I don't want to forget how I did it I've had no problems with the rest of the house and that's how I wired everything so you do what makes sense to you and of course if you're a professional electrician you know what you're doing already so you find out where your wire is going and then you drill the holes and I like to use a nice half inch paddle bit like this first hole I'm going to do is this one right here so I can get the wire up afterwards in here and I like to go in the middle of the studs perfect that wire will come up here and then I want my other wire to come out here there's holes right here that I can reuse but over here I want to go high enough where I don't have to just bend the wire at a real tight angle I want it to kind of swoop up and go like this so I want to be high enough up that I so that I can do that [Music] there we go and reuse that hole and that hole and we got to do something in this corner so my next box is right here so I want to do my wire about here so I'll do these holes about that height and over here it would make sense to reuse this hole although I don't know where this wire goes and I don't know how that's run so I'm going to stay away from that and go up here at about the same height as these over here so I got to get through this corner which can be a little tricky I'm gonna have to move this insulation as I go I'm not going to tear it all the way out just because it's getting colder first hold go this way and I should be able to get behind this stud so go far enough this way [Music] there we go and I just want to line it up and try and drill the hole the same place and get a little tight in here [Music] before I move on I'm going to see if I can get this wire through I'm going to bend it kind of like this so I can sneak it around and hopefully get through this hole let's see this can be tricky well sometimes it's easier just to do it like this you can also use a wire snake basically like a kind of like a coat hanger smaller that you can bend in here fish it through attach the wire and pull it through but a quick way to do this is to take these wires cut them off like this now you have a smaller wire to go through first and then you can pull the rest of it and see if this works when in doubt drill it out use a three quarter inch bit [Music] got you there we go okay now I know that's going to go through just fine so I can drill the other holes [Music] all right run this over here first make sure we get plenty of wire I'll pop one of these feed this in so you want this to kind of sweep and not be real tight like this like you don't want to put a staple right here and make it like an angle like this so what I like to do is hold it something like this because you do need to get a staple close to the Box so I'm going to put one right here and then on this side since the hole is lower on the other Stud I'm going to get it out like that staple here just make sure you don't staple Through the Wire right here going through is good and I know if you're watching from maybe a European country or something like that I've gotten a lot of comments that are like you're running wire with no conduit in the walls and yep that's what we do here in the good old us of a plenty of line here I hate old insulation yeah obviously this insulation is going to be changed out not quite yet a wiring inspection first I'm gonna feed the wire in here these boxes are difficult to get the wire in oh I put a staple right here but I'm going to wait because I'm running another wire out of this box that's the name of the game drill holes put the wire through I got a mask on because I'm gonna mess with this insulation obviously I have to go under this window so I gotta go lower here obviously this would be a lot easier if you had wires run before but I have no outlets in this room that would save you the step of having to drill the holes but not for me all right [Applause] ah there's a double stud there [Music] [Applause] [Music] there we go that worked right angle adapter [Music] that's hot oh yeah foreign if it works it works now I'm going to run a wire to here I'm going to replace this this is for the basement stair area there's some shelves here that I have a vacuum and actually a battery charger on the other side so I'm going to run a wire here and just dead end it until I get rid of this foreign number one two three four and five and that's going to feed the basement stair outlet and then I'm gonna run one up over here above the header and then it'll come down here and then that will feed the lights for the closet and for the bedroom and actually it will go out to the hallway where I have an outlet here we have lights right here and that's the switch for it and then over here I'm going to run a line up for the smoke detectors and they're going to be in every bedroom and one in the hallway and one in the basement but we'll talk about that later [Applause] there's a line that I left long upstairs that I can fish down oh really long come on Matt what were you thinking yeah I can get some Staples in here that goes down to the outlet and then it goes back over to the switch and then up to the lights over here which I gotta take care of as well so go to my first light in the bedroom I'm just going to hook these lights up as I go these boxes or these led drivers is actually what they're called that way I won't have to worry about it I can actually take down these are super easy super duper easy the insulation off take my wire strippers and and make sure I put it in where the 14 gauge goes then I got my other wire here it's going to go like this that's going to go out to my second box so I'm going to do the same thing and these are quick connects so all you do is just push them in and they're good that's the ground do this ground just make sure it locks in neutral and this neutral and the hot pop this off this one feed it in there so it pinches it like that same thing with this one like that make sure all those wires are tucked in there you're good moving on foreign to get from this light to This Light I'm going to drill through the middle of these joists foreign box I only have to do one wire so that's the end of the Run so these light boxes or LED drivers are all set wires all run tucked up in there now I want to take care of the stuff in the hallway and now I have to figure out what I'm going to do for my lights because originally I was going to put a light dead center of here but then I decided to move the attic staircase to here so obviously I'm not putting a light there and then I was going to put a light in the center of this door opening right here so what I think I want to do is Center a light in between this door over here but then have it centered in this hallway so from that crown molding to that crown molding it'll probably be about here and these are four inch LEDs and then back here I think if I put one here it'll be too close because if you look back here with these lights these are all the same distance from here to here and to here so what I'm thinking is I might split the difference I'll have a light down there at the end and then I'll measure from that light to that one and go Center of that so if it's off center of this closet that's fine I don't have a light in the closet but I think that'll be plenty of light for this hallway so I cut out the template and popped it up there and it's going to look like that and then I centered this one in between that one at the end of the hall and this one and I think it looks pretty good this one will light up all this around the corner and this one should light up this area and be enough light for that closet so I can drill a center hole in here and in that one just so I know where to put the the boxes or the drivers upstairs so I'm upstairs now and a couple of things as I said I was going to put a light in the center here but then I decided to put the attic ladder there so I ran wires but then I had to take them out so I still have a box right here but I'm gonna have to change that box out because I chose some new lights because I found these things which have a night light in them I thought that'd be really cool in the hallway if you're you know getting up in the middle of the night going to the bathroom getting some water but the unfortunate thing is they are not as forgiving as the super thin lights so if you look over here where the hole is for this one it is right dead center of the strapping so I have to cut that strapping out and then over here there's a hole right there so I have to cut that strapping out and I'm also in between those going to do a hole for a smoke detector because I need to get a smoke detector outside of each of the bedrooms and that is a good location for it in between those lights but that one I'm going to have to shift over a little bit so I don't run into the joist because that's a regular round box so I'm gonna have to cut that strapping cut that strapping and that strapping it'll be fine with holding up the drywall it's only that hallway so I'm not worried about that just a couple extra steps and then I can install the driver over there the box right here driver right here and then I'll cut the holes and put the lights right in there and hook them up so I don't have to worry about it you estimate how much I have to cut out here coming to about here use my handy dandy tool [Music] [Music] suppose I can just Mount this driver on this one the color temperature is right here and I'm going to set it to 3000 which is going to match everything in the kitchen and the living room [Music] okay remove this box and this is actually going to be easy because I read a comment I I took out the box when I moved the attic ladder and I said when I moved that one I had to cut these because they wouldn't come out if you just pull them they won't come out and then somebody commented and said all you have to do is grab it and Pull and wiggle at the same time and there we go a little bit of effort but I'm going to be sure not to use that piece that I ruined then I'll actually be able to return these lights save some money for all my mistakes I shouldn't say mistakes my my decision making my indecisiveness okay these wires out of the way now this box is going to need to go here so I'm actually going to have to shift that over because I'm going to run into a problem here so I got to go over about an inch or two so I'll hack this oh I'm going to cut this hole out I'm going to trace this uh you can use a RotoZip which is the drywall thing that goes cuts a hole you can use a hole saw but I like to use a good old-fashioned key saw because I find that makes the least amount of dust so we'll cut this out okay and we have a hole grab my wire make my connection tighten it up and then let's cut these spring thingies push it up this put it into place by the way you can use these in a shower they're good for wet locations I'm gonna try and get these ones at least on by the end of this video so you can see what they look like [Music] this way to avoid the scrapping peace East okay cool now while I'm here I'm going to cut out the box for the smoke detector remember I have to shift this over about an inch to get away from that joist and then I'm going to trace this box that is not the line I actually want to cut I want to cut just shy of that and tighten the screws so let's talk about smoke detectors that one I just put in the hallway or the box for that smoke detector needs to be outside of the bedrooms that covers all of these luckily they're all in the same area and that one has to be a smoke detector slash carbon monoxide detector and I need one in each bedroom here here and there and one in the basement and the one in the basement needs to be a carbon monoxide detector as well and all of these are going to be hardwired and the reason I'm running them off of this circuit is that you'll know if the breaker is off if it's on its own circuit then you're not going to know the battery is still going to be in the smoke detector at least a light will go off in this bedroom and you'll know that there's a problem and there's all kinds of rules and regulations and codes for countries states even towns I'm sure so don't take this as the standard this is just what I'm doing for my house this is going to be a long video huh so we're going to do the easy one first I'm going to put all of them in the bedrooms uh try and get about two feet away from the door and put them right around this area so I'll probably put this one in line here I'm gonna do an old work box so all I'm going to do is curl the wires up and sit them in there and I'll cut the box out afterwards I'm gonna run a line right here 14 2 up here and over here curl it up and then 14 3 from there to every other smoke detector including the one in the basement and that way they're all interconnected if one goes off they all go off whoa got my first wire run for a smoke detector in this bedroom and now it's time to do the not so easy ones so in this bedroom you can see I have an existing smoke detector here I'm going to change that out these are all wirelessly interconnected which are really cool but I want to hardwire them all so that Mark right there is where I hope to put this one depending on what I find upstairs and then in this bedroom I'm going to put one right there and these are kind of in line with the lights that one that way and then this one in line this way so upstairs that's where my first one is going and this is the bedroom so the one in that room is gonna go somewhere around here so I'm gonna have to clean all this out and take up hopefully just one of these floorboards drill a hole through here connect it bring it back out run it over here there's the other bedroom take up hopefully one of those floorboards I'll probably cut it half on a joist just so I don't have to take up the whole thing and move all this stuff move my Cheerios and then I can bring it back out here run it over to my smoke in the hallway and then bring another wire down into the basement but we're going to start over here and try and find that one I have too much stuff figure out which floorboard oh hopefully it's this one because this ends right here let me see if I drill a hole if it ends up around here does that be cool foreign [Applause] dead center okay as you can see there's some kind of strapping right here so what I'll do is move over a little bit just so I don't have to cut that out and I'll still be right around where I want to be sweet so let me go down and cut that out I gotta run the wire I'm gonna run two wires both 14 3. foreign now I should be able to just cover this up if I know that it's good fluff this insulation back up look no mold people worry about that a lot foreign I think this one is about right here so I'm going to cut this half on a joist and pull this up [Music] I don't know split oh look that's convenient insulation split right here [Music] oh yeah cool this smoke detector down you served me well you must retire [Music] foreign [Music] and put this back together lift up the insulation foreign [Music] so the next three wire needs to go down to the basement so what I'm thinking is going under here going along this joist down this hole and straight down here so this is where I'll go into the basement but I want to make sure that I line up in the right place so what I did was I put a hole right here and put this little piece of paper down and I want to see where I end up if I end up drilling a hole in here let's go down take a look a piece of paper is right here and it's going to be close looks like I'm going to be right at the edge of that joist but I can bring it down here and put it about here the stairs are right here and I want to be away from the furnace a little bit so usually you want to have it at the bottom of the stairs here but I'm gonna pull it this way just a little bit [Music] [Applause] I'm gonna start with a nice long wire so I know I don't run out as you route these wires you need to make sure that you're under or over any obstructions so that the wires routed properly here I'm going to put plenty of wire down there and go down and hook it up in the basement first work my way back up on the line I want to make sure I'm behind this box feed the wire down the hole and to the basement [Music] [Music] [Music] I'm gonna push the extra wire back up into the Attic foreign hey while I'm here I can hook up the closet light anybody else put recessed lights in their closet or just me probably just me side hammer foreign these up ever so carefully yeah kind of like that with a loose staple so that way when I do the drywall I can just put my hand up there and find where they are pull them out of that staple and connect them to the Box let's get this box in oh you thought it was over huh nope we're gonna get this box in we're going to take all these old wires out that one right now is live this one is not we're going to follow it upstairs and take it all the way out so that wire comes up and it goes under these joists and over to a junction box right over there so we're going to disconnect it from there pull it all the way out I disconnected this from the panel when I did the kitchen this was actually feeding that basement Outlet or receptacle whatever you want to say and it also went out to my only outside receptacle and it also fed the microwave so yeah this had to go and the wiring is pretty sketchy and if you look closely you can see this actually sparked up at one point and almost caused the fire I was actually up here when it happened I just moved this wire around while I was remodeling and it I heard some zapping and saw some Sparks and luckily the breaker tripped but yeah scary stuff so that's when I decided to get rid of it and shut the breaker off for good so now I'm getting rid of it taking it out of my house bye-bye foreign [Music] I'm going to take this apart from the other side and at least get these wires out figure out what to do with this box this is a pretty handy Outlet I charge things that I don't want sitting on the countertop or anything like that so I want to keep it eventually I hope to redo this whole area right here and do some kind of shelving that's better than this or maybe even an extra little Pantry area or something but for now we're just gonna make it as good as we can I am concentrating on the bedroom remodel oh yeah that's that's wiring you want to leave in your house right bye love this tool foreign eventually this wall is going to come out and then I can pull this back this will be the actual wall eventually so I figured I'd put it in just like that for now yeah might have to cut that it's a little tight foreign so down in the basement these are the two lines coming down this is the one that's still live that's the one that we just disconnected I'm gonna see if I can pull that down nice I'm just going to follow this along and try and get this wire out it is disconnected from the panel so I'm not worried about that [Music] so that line is gone and now for this one it is still live so we gotta follow it and see where it goes goes over here up here to a junction box and then this wire goes up over here back over here and then up and around here for this junction box so that's the power coming in and then this goes out to something else and that is the line that goes up to that outlet so I need to find that breaker and shut that off so I can disconnect it and just keep these two lines in there and the breaker it's on for the basement lights [Music] boom so I can shut the basement lights off and take this apart now I know this isn't the best tester in the world but I am sure that this is what I just shut off those are live let's go to the kitchen nothing here I'll take it apart and test again I just don't want to disturb these wires too much because I'm not changing these out just yet that'll happen when I do something with the basement I'm going to be careful pull these out I'll test again nothing nice that one's good that one okay carefully tuck these back in these ones are actually in better shape than a lot of the other ones so happy about that all right One Less Old dangerous wire can I just rip it down if you're wondering why it's uh in here so funky that was me just getting it out of the way while I did my demo work I still wanted to have a working Outlet I can actually keep this Outlet reuse it that looks better now can't forget about the cable [Music] I'm gonna feed a cable up from down here start big hammer tiny nail route it the same way this one is I don't think I'm going to be able to reach up there there's just a lot of stuff in my way I'm just gonna get it through here and I can nail it up later look at this other disconnected cable now I'm gonna find the breaker that goes to this Outlet up there and I believe it's this one yep so my new hole is right there I have a couple staples I need to take out and then I'm going to cut the wire push it up there and put staples here and then we'll put it in that box in the new location up there and one thing you should always do for an inspection is put your panel cover back on they don't like it when it's off neither do I have another reusable receptacle why isn't it working they're not very good foreign okay all right all right guys we're on the home stretch of this video now this is the power coming from the panel this is going to come in here they're like that now let me show you how I make up these boxes for inspection I make these all similar length I take all the wires out now what I like to do is separate all these and then get my grounds and just tie all of my grounds together kind of braid it like this nice and tight take my linesmans but even tighter I take my longest ground which is this one right here and I'm going to cut the other two off like that I'm going to take a greeny it's basically a wire nut with a hole in the end this is for grounds and do this and then if you have to you can pigtail off of this but I'm going to have one Outlet in here that this ground will go to and now anything else I do not touch I just tuck it all in the Box the only other thing I'm going to do is put wire nuts on The Wire that comes up from the panel just in case that breaker gets flipped I'm going to put these on so we have no issues and then just tuck everything in here so that when you drywall we don't have an issue when you cut this out just like that so I do that with everything how do you guys do it let me know nice and tight in the back of that box all the outlets and the smoke detectors are pretty easy to know where the wires go this is a different case so I'm actually going to label these so I'm going to put all these wires in strip them label them tie all the grounds together like I just did and yeah do the rest with the rest of the outlets if there's any wires like this that are a little too close for comfort and you think that your screw might go into it when you drywall this you can put these plates up super simple to install just like this unfortunately with this corner I'll just have to bring the screws out here a little bit further but that's no big deal for instance I'm going to do this entire wall because they're two by three studs and they're only about an inch to that hole so just to be on the safe side I think code is an inch and a quarter from here so I'm gonna put these on every stud [Music] okay so let's recap we got power coming up goes over here those boxes are all set wires tucked in ready for inspection got my nail plates here wires going in there cable and it goes around here down here last output of the bedroom Outlet to the basement power comes up over here and then I got my box this goes out to the closet lights and the lights here and also over here I have my wire going up to my first smoke detector here smoke detector in this bedroom smoke detector in this bedroom one in the hallway and then one in the basement and then a wire also goes out to this Outlet and then the switch and goes up to these hallway lights I know this was a long one and since you're still watching I'll give you a little special treat and I hooked these up temporarily so you can see the lights I'm gonna have to say that that is perfect lights all this right up and in fact it goes even brighter those are pretty bright you can turn them all the way down dimmable and now the cool thing when you flip this off and flip it back on within a second and a half you have Night Lights and in fact the night light is dimmable as well so cool so there you go that's the very least I could do for you for sticking around this long as I said I know it's a super long video so I hook those up temporarily I'm not going to show you how I did it because it's pretty so now all I have to do is wait for my inspection and hopefully I pass like I said in the beginning of this video this is not a how-to video this is just how I ran all my wiring for this bedroom so I hope you guys enjoyed make sure you like the video because that helps me out so much and subscribe if you haven't already and another little bonus for you for sticking around this long is there was a lot of outtakes in here so I'm just gonna drop them all at the end here thanks for watching and we'll see on the next one and then go down to the switch you can do that because you can no I don't want to say that crap because it goes up to the lights and the line is done a lot of wow what a hack thou shall not Place receptacle within three feet of two adjacent doorways in the month of October that's how the code book reads by the way in case you didn't know I'm just blabbering why am I blabbering so much pretty pretty ugly nailed it fourteen two where are you got some wire to run now on the lights if you want to do the fancy that's stupid and there's all kinds of fancy terms like line and load I just can't get this oh oh ow ah ow hi you filming I hope so no getting these angles ain't easy bro don't look at my butt and tie the grounds together and go up you uh the try it again try it again really my thing and then on the other side that doesn't make sense to me I know these ones that grab oh my God hello oh come on you kidding me serious screws stripped this is I'm trying to be a real electrician using linesmans as a hammer I just can't do it don't have that technique down and I like to use a nice half inch and then you need to drill the holes and I use so you find out where your wire is going through not leave this corner I'm going to have to screw it about right here but that'll be right now right now so stupid right now right now right now right now right now dumb it's my living room my dining room my kitchen and the bedrooms this is the last room say that sad"

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"VideoID": "506",

"Title": "Electrical Wiring Process - Part 9 - Installing a Light with a switch leg - Come wire with us",

"URL": "https://www.youtube.com/watch?v=jhwmBYgdcf4",

"Keyword": "Electrical wiring installation",

"Transcript": "let's talk about a circuit that we can make using a light fixture and a switch and doing it with a process we're going to call a switch leg or a switch loop this is going to be a circuit that's going to be set up with our power cable coming into our junction box that's going to house our light fixture this is different than another circuit that we did where the power came into our switch box so as the power comes into our light fixture box this junction box contains the power and it's also going to have our light fixture but we don't want to connect it directly that's just going to make the light be on all the time that's not what we want we want to be able to control that light with a switch down here a single pole switch so what we're going to do in a nutshell is to take this power that's coming in run it down to our switch then come back up and then power our light fixture with it that process is called creating a switch leg or a switch loop and if you pull up your schematic we're going to go ahead and post it here and it'll be up it will be our map that we'll follow i'll show you how that switch leg translates to this mock-up here so as you see in your presentation or on the map or schematic you're going to have your power coming in it's going to be a 14 2 wire we're going to add another material into this exercise it's going to be a 14 3 wire if you remember from materials a 14 3 wire has the same gauge conductors in it but it adds one conductor and not only will we have our standard white insulated conductor and our black insulated conductor we're adding a red conductor in here as well we're going to have our bare ground just like we do in our 14 2 so i've got 14 2 coming in and then i have a 14 3 running to our switch box that's our setup with our cables also keep in mind that our power is being fed into here on our 14 2 then we're going to route it into our box with this 14 3. so looking at this schematic a little closer i'm going to relate it to this mock-up so let's go through this one wire at a time so i've got my ground bare grounds coming in from my feed cable and it's also this ground wire is going to have to carry out down to my switch we're going to have a ground terminal at our switch that we have to connect to so this is going to give us continuity down to here we don't have a ground terminal on our light fixture so we do not need a pigtail that's going to connect to this light fixture so this will be two wires twisted together with a wire nut no pigtail moving on our typical process is then to deal with our neutrals so i have two neutrals one on my feed wire coming in and then one neutral going out code tells us that we have to have a neutral wire in every box so this these two wires are going to get connected together and then my light fixture has a neutral terminal so i will need a pigtail that will connect these two wires to this terminal the silv silver terminal on my light fixture that gets our neutral taken care of in this box when it comes down to this box i've got a neutral here but if you remember our single pole switch has no association with any neutral wires so all we'll do here is to we clip the end of this neutral wire we're just going to cap it off that gives us our our neutral wire in this particular box and keeps us legal as far as electrical code goes from our neutral we can then work with our black wires or our hot wires so i've got my live hot wire coming in here that's my power i don't need to connect that to my light fixture yet what this needs to do is to carry together with this black wire is going to carry the power into my switch box that is the only connection we need to make is this hot wire to this hot wire that's going to feed live electricity to my switch that will get connected to one of my terminals at my switch and then it's going to carry by the red wire it's going to carry through the other terminal back to my light when this red wire gets energized when you turn on the switch it's going to give power to my light fixture here and that one's going to connect to my gold terminal on my light fixture so with all of those connected we've got a nice working circuit that has a switch leg on it let's go ahead and do this i'm going to start with my ground wires i'm going to work this box first which is my light fixture so i'm going to twist my grounds together and there's only two i don't need my pigtail because i don't have a ground terminal on this specific light fixture so once they're twisted together i'm going to go ahead clip them off clean and now i can twist on my wire nut grounds are taken care of next up i need my neutrals connected and i'm going to use a pigtail connected to them that will then connect to my light fixture so this is a three wire connection and these will get twisted together nice and tight we'll clip them off at the ends and now we can put our wire nut on so that takes care of my neutral connection make sure you get this twisted on super tight and make sure that you start to see these insulated jackets winding together that's going to tell me i have a good solid connection now i have a a bent hook on the end of this that we'll go to if you remember our silver terminal is the one that we're going to always connect to our white wire so i'll go ahead and hook that on there and we're going to tighten that up and we want our hook turned in a clockwise direction because that's the way we're tightening our terminal give it a tug to check it so now we need to work on we need to pass our live feed through the box to our switch we're going to connect these two black wires together so once we get these done we can cap those off with a wire nut and now we have one more wire to connect in this box i'm connecting this wire out of sequence if we're talking about the path of the electricity i have this wire here which we know is going to come from our switch with power since i'm already working in this box i'm going to go ahead and connect that wire to my terminal my red wire is the one that's carrying my current back from my switch leg so we're going to think of our red wire as if it was a black wire it's a live wire that is going to carry our current so we'll go ahead and connect that one here and once we've got that tight we are completely finished with all of the associated wiring to make the circuit work in our light fixture junction box we can pack these wires up i'm going to start with my ground and i'm going to push it to the back to make sure it's not touching any of my terminals or wires i'll then work my neutral in and you can kind of work these in and around each other and then i have my black wire i'm going to fold in here now i can set my box in i mean my fixture in my box and so that is my light fixture so i'm ready to move on to my next box which is going to have my single pole switch in it so our we're going to start with our ground i have one ground wire and i have a ground or green terminal on my switch so this connection is an easy and logical one to make we're going to go ahead and tighten this ground terminal onto that bare copper wire first connection done we're moving on to our neutral this is where our neutral has no connection to our switch so what we're going to do is we're just going to cap it off and i'm not even going to strip the end because it's just going to get a cover of a wire nut over it so i'm going to go ahead and tighten that wire nut over my neutral wire that wire is done this will just get packed in the box not unlike our ground that we put up here that we didn't use and now i have two terminals on this side and i have two uh two conductors that need to connect one to each terminal it doesn't matter on a single pole switch which terminal goes to which wire so i'm just going to use i'm going to try to keep the wires from crossing each other and connect them in the most convenient way and my black wire is getting connected that one's nice and tight now i'm going to connect my red wire so a quick review of what we just did we've got our live wires coming in from here it's a 14 2 got a black and a white and a ground coming into here my black wire is carrying power into this box but we're bypassing this box and bringing that power down to this switch the red wire is then bringing that live wire or that live power when i turn this switch on this is bridging these two terminals the power is carrying then through the red wire back up and that's what powers my light so this is what a switch leg is is a way to remotely turn the power on and off we're bringing the power into this box and then we're we're using this remote box to for the power to travel to to then get switched on and off and then back to this box that's a switch loop or a switch leg we can go ahead and pack these wires into this box all of these wires are connected to this device i'm going to go ahead and pack my loose wire in first so this neutral is going to get pushed to the back and there's no chance with this wire nut on the end of this neutral wire coming in contact with any of these live terminals now i can turn my switch the right direction so that when i turn it up it says on when i turn it down it says off i want to fold my wires in keeping my ground wire off to the left so it doesn't interfere with my connections here i'm going to fold my red and my black conductors in i'm going to line up my screws and then i'm going to tighten this device up so i've i'm not going to go ahead i'm not going to mount this device completely i just have it in place for now but as you see here we have done a variation of another circuit that we built but we've reversed the way the power comes into the circuit there are a lot of variations you can do in electrical to get the same job done and it is the the job of the electrician to understand the path of the electricity and all of the rules and all of the parts that need to come together to make this circuit work well so i hope this makes sense and good luck with this exercise when you if you go do this in an actual skills exercise and i'll see in the next lesson"

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"VideoID": "508",

"Title": "DIY Shed Electrical Rough In &amp; Wiring",

"URL": "https://www.youtube.com/watch?v=fTODIqjuj7M",

"Keyword": "Electrical wiring installation",

"Transcript": "hi everyone welcome back to the channel uh today is day one of electrical rough-in so uh going to start by putting the boxes up on the wall I have a total of seven Outlets that are going to be kind of around the um the three walls I'm gonna have two outlets on the ceiling for the lights um so there's gonna be two LED lights High Bay Lights 100 watt um and they're going to be run on a dimmer switch and then the other uh item is going to be the heater so and today I'm going to get the boxes up and start drilling some holes through the studs and uh probably pulling some wire as well trying to get everything just in place and then I probably won't wire start wiring today but um yeah that'll be another day so anyways enjoy [Music] foreign so basically what I'm doing here is I'm taking the electrical box and uh basically measuring up 42 inches and I've drawn a line there and uh basically put the box it's got these little tabs on the side here up against the stud I also have a vapor barrier box around there as well and then I've just screwed it into the stud as you can see [Music] thank you foreign [Music] [Music] so you can see what I'm doing here I'm just uh cutting a slit in that Vapor box to slide the that little wing through so I can screw it into the stud um I don't know if you're technically supposed to do that but I don't know I don't even know if most people actually use these these Vapor boxes but uh I thought I'd thought I'd try it and just put them on there and I could be kind of ruining the whole thing just by cutting it but uh yeah I don't know first time I've done this so anyways foreign um so I'm going to keep it really close to the panel and just inside the the door so I'm going to put it on the one stud here and I think I'm going to put it up above 48 inches so moving on to the uh the boxes for the lights now um so basically I'm going to have two high Bay LEDs in here um so how I'm going to do it is it's 24 feet long I'm going to set both of them six feet in from the ends um so I'll try to install the boxes um kind of in the right area on one of the studs and um yeah so all the outlets are now installed got all the wall outlets and I just finished the ceiling Outlets I got one there and one over there welcome back folks so today um I'm gonna get to drilling some of the holes and hopefully pulling some of the cable for electrical so for doing the holes for the wires I'm using a right angle um drill with a three-quarter inch bit self-driving bit from Irwin works pretty well so far I have hit a few Nails here and there so I'm gonna have to go back and clean up a few spots but uh otherwise it's it's going good [Music] foreign [Music] foreign [Music] [Music] [Music] thank you [Music] thank you [Music] foreign [Music] laughs [Music] [Applause] foreign [Music] foreign foreign thank you so this is my kind of ghetto setup right now I've got basically I'm trying to extend the bit so I can get through the studs um I don't know how long of a bit so I've put kind of all these pieces together and uh it's not the greatest setup but it's uh it's working okay so foreign [Music] [Music] so I got all the holes drilled for the wire it was uh bit of a pain in the butt um I happen to hit a few Nails along the way that were from the sheeting into the studs so that was a little bit tricky but I managed to get through it and now we're on to feeding the wire so the first wire I'm gonna run will be a 10 gauge wire um basically this is going to be to to directly wire in the uh the heater that I got um so it's a little bit heavier you can see here or maybe not I don't know thicker wire but um yeah [Music] thank you [Music] thank you [Music] [Music] thank you thank you [Music] [Music] foreign [Music] foreign [Music] so I got the 10 gauge wire pulled through as you can see here left a little bit extra here um I'm gonna probably staple it to the stud there it's a little bit difficult pulling 10 gauge wire let me tell you through the corner there and then over here I'm gonna end up putting a heater probably up in the corner here so I'm just gonna leave it there for now and then I might have to put it up through the top plate and we'll see I think the heater has to be eight feet off the ground so [Music] thank you [Music] thank you [Music] [Music] thank you [Music] foreign [Music] foreign [Music] so I've run the first cable for the outlets um and I've run the cable for the heater I got around one more cable for the outlets um because I'm kind of offsetting uh every other Outlet so I've got them split up on two different circuits if that makes sense so um gotta run that wire now and then lighting I got to run that 14 gauge wire and then that part will be done [Music] thank you foreign [Music] [Music] [Music] thank you [Music] foreign [Music] so I've got all the wires in for all the outlets and now I'm going to do the wiring for the lights so I'm going to run 14 gauge wire from the panel up and around and then at this point go up through the top plate along that rafter to the outlet there and then I'll come back down the rafter and run it probably in the same hole as the 10 gauge wire and I'll run that down the wall foreign and then up through that top plate to that outlet [Music] thank you [Music] [Music] [Music] thank you [Music] [Music] foreign [Music] thank you [Music] foreign [Music] so all the wiring is in now and I've actually fast forward a little bit so all the outlets are now wired switch is wired and the sub panel is wired as well so I'm just gonna walk you through and show you what things look like so uh we got the switch and the sub panel here and you can see I've kind of cleaned up the wiring a little bit Outlets are all in so these are all 20 amp Outlets wired on 12 gauge wire so I got two along this wall and two along this back wall and sorry for the mess in here it's uh it's quite a bit going on right now but and we've got two more Outlets there so this is kind of where the workbench is going to be in the future and then we have an outlet down here near the garage door and then up on the ceiling I've got uh two 15 amp uh Outlets wired in on 14 gauge wire and those are what the lights will be plugged into okay so just a rundown on the sub panel here so you can see I've got all the wires coming in at the top of the sub panel so we've got the red wire which is 10 gauge which the um heater will be hardwired into and that is on this 30 amp breaker and you can see we've got the white wire coming in it is 14 gauge it's on the 15 amp breaker here so that'll be for the lights and I've got the two yellow 12 gauge wires coming in they're hooked up on the 20 amp Breakers um this is my first sub panel I've ever wired so I think I've done it correctly I'm going to have electrician come and uh kind of look everything over and just kind of sign off on it but I've got the uh the wires clamped on there at the top of the box coming in and I basically routed my hot wires um around to The Breakers they come in on the breakers the ground wires come in on the ground bar back there you can see them kind of going up the side and around and then I've got the neutrals coming in on the neutral bar right there and you can see here I got the switch I've actually kind of changed it up I was originally going to do a dimmer switch and decided against that it's a little bit more wiring and the lights I got I tested them out already actually I'm going to make another video about that but um they're not they're not too bright that it's overpowering so I think uh going without a dimmer switch will be okay and you can see here I've just cleaned up the wiring a little bit so I've used these um they're like little wire holders that get nailed into the into the studs there and they kind of clip together and they just keep the the wires a little bit neater in some cases I have used Staples so up there you can see I've stapled the two 14 gauge wires together and I've kind of made these Loops I didn't want the uh the wires to be super um super tight on the corners so I've kind of got them looping around and then at each outlet I also left quite a bit of extra just in case for whatever reason we need to pull more through and rewire or change something out so so you can see here I've got that 10 gauge and 14 gauge going through the same hole again stapled together nice and neatly up to the outlet Outlet here so a little bit extra and I was kind of stapling just on the insides here just above the above the outlet and that 10 gauge wire is um just kind of sitting there right now I think I'm going to drill a hole and have it come up through the top plate because that heater as I said before has to be eight feet off the ground so I think I'm going to put a piece kind of across the corner there and mount the heater up there eventually okay as you can see I kind of cleaned up those wires a little bit got them going up and over to that outlet sorry I gotta walk around my ladder here as you can see wires coming over second last Outlet and then running up and over to here so that's the last Outlet right by the garage door so yeah there it is and um next video we will be taking a look at uh the lights I got so you can see here these are the lights they are uh High Bay lights um 100 watt I believe and their boat 21 000 lumens so we've actually already got them wired in but I'm going to do a whole I got a whole video coming on that um and uh yeah well there you have it so thanks for watching guys I know it was a bit of a long video but uh I just wanted to show all the different steps for the electrical rough-in and um if you like this video make sure to hit the like button down below and subscribe and we'll see you next time foreign"

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"VideoID": "509",

"Title": "Types of House Wiring - Types of Electrical Wiring - Electrical Wiring",

"URL": "https://www.youtube.com/watch?v=A5P-buWX-dA",

"Keyword": "Electrical wiring installation",

"Transcript": "Electrical wiring is an electrical installation\nof cabling and associated devices such as switches, distribution boards, sockets and\nlight fittings in a structure. In other word Electrical wiring is the electrical power\ndistribution through the wires in a perfect manner for economic use of wiring conductors\ninside a room or building with better load control.\nFirstly we will see, Factor affecting the choice of wiring.\n1. Durability: Types of wiring selected should conform to standard specifications, so that\nit is durable i.e. without being affected by weather conditions, fumes etc.\n2. Safety: The wiring must provide safety against leakage, shock and fire hazards for\nthe operating personnel. 3. Appearance: Electrical wiring should give\nan aesthetic appeal to the interiors. 4. Cost: It should not be prohibitively expensive.\n5. Accessibility: The switches and plug points provided should be easily accessible. There\nmust be provision for further extension of the wiring system, if necessary.\n6. Maintenance Cost: The maintenance cost should be a minimum.\n7. Mechanical safety: The wiring must be protected against any mechanical damage. Electrical wiring basically three types, there\nare: 1. Internal or House wiring.\n2. Overhead wiring. 3. Underground Wiring.\nInternal or House wiring consists of an electrical wiring system that distributes energy to be\nused in equipment and appliances around the house or indoor. It also involves the proper\ninstallation and operation of the electrical outlets, switches, breakers, meter base and\ndifferent electrical circuits. Commonly Internal or House wiring is four\ntypes: 1. Cleat Wiring.\n2. Casing Wiring. 3. Batten Wiring\n4. Conduit Wiring. Cleat Wiring: This wiring comprises of PVC insulated wires\nor ordinary V I R that are braided and compounded. They are held on walls and ceilings using\nporcelain cleats with groves, wood or plastic. It is a temporary wiring system, therefore\nmaking it unsuitable for domestic premises. Moreover, cleat wiring system is rarely being\nused these days. Some Advantages of Cleat Wiring:\n� It is simple and cheap wiring system. � Most suitable for temporary use i.e. under\nconstruction building or army camping. � As the cables and wires of cleat wiring\nsystem is in open air, Therefore fault in cables can be seen and repair easily.\n� Cleat wiring system installation is easy and simple. Some Disadvantages of Cleat Wiring: � Appearance is not so good.\n� Cleat wiring can�t be use for permanent use because; Sag may be occurring after sometime\nof the usage. � In this wiring system, the cables and\nwiring is in open air, therefore, oil, Steam, humidity, smoke, rain, chemical and acidic\neffect may damage the cables and wires. � It is not lasting wire system because\nof the weather effect, risk of fire and wear & tear. Casing Wiring: It was quite popular in the past but it is\nconsidered obsolete these days due to the popularity of the conduit wiring system. The\ncables used in this electric wiring were PVC, V I R or any other approved insulated cables.\nThe cables were carried through the wooden casing enclosures, where the casing was made\nof a strip of wood with parallel grooves cut lengthwise for accommodating the cables. Some Advantages of Casing Wiring:\n� It is cheap wiring system as compared to conduit wiring systems.\n� It is strong and long-lasting wiring system. � Stay for long time in the field due to\nstrong insulation of capping and casing. � It stays safe from oil, Steam, smoke and\nrain. �No risk of electric shock due to covered\nwires and cables in casing & capping. Some Disadvantages Casing Wiring:\n� There is a high risk of fire in casing & capping wiring system.\n� Not suitable in the acidic, alkalies and humidity conditions.\n� Costly repairing and need more material. � Material can�t be found easily in the\ncontemporary. Batten Wiring: This is when a single electrical wire or a\ngroup of wires are laid over a wooden batten. The wires are held to the batten using a brass\nclip and spaced at an interval of 10 cm for horizontal runs and 15 cm for vertical runs. Some Advantages of Batten Wiring.\n� Batten wiring installation is simple and easy.\n� It is cheap as compared to other electrical wiring systems.\n� It is Paraphrase is good and beautiful. � It is strong and long-lasting. Some Disadvantages of Batten Wiring.\n� It can�t be installed in the humidity, Chemical effects, open and outdoor areas.\nThere is a high risk of fire in Batten wiring system.\n� Not safe from external wear & tear and weather.\n� Heavy wires can�t be used in batten wiring system. Conduit Wiring:\nThere are two additional types of conduit wiring according to pipe installation.\n1. Surface Conduit Wiring and 2. Concealed Conduit Wiring. Surface Conduit Wiring:\nIf conduits installed on roof or wall, It is known as surface conduit wiring. In this\nwiring method, they make holes on the surface of wall on equal distances and conduit is\ninstalled then with the help of rawal plugs. Concealed Conduit wiring:\nIf the conduits are hidden inside the wall slots with the help of plastering, it is called\nconcealed conduit wiring. In other words, the electrical wiring system inside wall,\nroof or floor with the help of plastic or metallic piping is called concealed conduit\nwiring. Obliviously, It is the most popular, beautiful, stronger and common electrical\nwiring system nowadays. Some Advantages of Concealed Conduit Wiring\nSystem: � It is a safe wiring system.\n� Safe from chemical effects, humidity and other external factors.\n� No risk of shock. � It is aesthetically appealing.\n� No risk of wear and tear, fire or damaged cable insulation.\n� Renovations can be easily performed as you can replace old wires easily.\nSome disadvantages of Concealed Conduit Wiring System:\n� Expensive as compared to surface conduit wiring.\n� Changing the location of switches or appliances is difficult.\n� Installation is complex. � Hard to find defects in the wiring.\n� Adding additional conduit in future is a tedious task. Overhead wiring:\nAn overhead wiring or overhead power line is a structure used in electric power transmission\nand distribution to transmit electrical energy along large distances. It consists of one\nor more conductors suspended by towers or poles. Since most of the insulation is provided\nby air, overhead power lines are generally the lowest-cost method of power transmission\nfor large quantities of electric energy. Underground Wiring:\nUnderground Wiring is the replacement of overhead wiring providing electrical power or telecommunications,\nwith underground cables. This is typically performed for fire prevention and to make\nthe power lines less susceptible to outages during high wind thunderstorms or heavy snow\nor ice storms. An added benefit of undergrounding is the aesthetic quality of the landscape\nwithout the power lines. Undergrounding can increase the initial costs of electric power\ntransmission and distribution but may decrease operational costs over the lifetime of the\ncables. Dear sir, Thanks for watching the video. More\nupdate please subscribes our channel Learning Engineering, and get notification to press\nthe bell icon."

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"VideoID": "512",

"Title": "Proper Way To Install P.V.C Trunking For Electrical Surface Wiring ✔ !! Simple Technique",

"URL": "https://www.youtube.com/watch?v=qPg-bVPfKxo",

"Keyword": "Electrical wiring installation",

"Transcript": "so guys as i said before am going to do a electrical surface work using trunking instead of tower clips to hold down electrical wires this is a 2.5mm twin and earth cable wire which i can easily use to with 2.5mm tower clips to hold the wire down the owners don't want to see the wires and they don't want the wall to be cut so this is the best option to use the 3/4\" or 1/2\" p.v.c trunking to cover the wires two ways to install these trunkings 1 is to paste on the wall and the other is to paste and screw using wall plugs and dry wall screws i use screws along with the paste so that the trunking won't rip of the wall in the future"

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"VideoID": "513",

"Title": "Wiring Of Hvac Heat Pump Electrical Installation Of AC Unit",

"URL": "https://www.youtube.com/watch?v=OuAQkUqepuM",

"Keyword": "Electrical wiring installation",

"Transcript": "morning folks today we're going to talk about heat pumps and uh how we wire heat bumps specifically the mini split ones so today we're here at a customer's house and we're going to install this uh the wiring for this fit this uh mitsubishi electric uh 15000 btu so it requires a 15 amp circuit double pole 240 volt we're going to put the disconnect in and the whip and show you how we do it it's quite a simple process so as noted the first thing we do is take a look at our uh our nameplate data to make sure that we're wiring it correctly so as you can see here that this is a 234 volt model uh it's a 15 000 btu and the voltage there's the max and the mins and we're gonna look for max fuse size so the max fuse size right there is 15 amps the minimum is 10. so we're going to run this on a piece of 12 gauge electric heat wire just because it's rated for 20 and we're going to put it on a 15 amp breaker so the unit is going to sit right here uh strapped to the side of the house and then it's going to run up and go into the the customer's living room right on the other side of this electrical panel which is in the basement which is good for us because it's quick and easy work so the first thing we need to do is drill a hole uh right about there so we're gonna go down in the basement and drill a hole out just because uh we want to make sure there's no wires in the way so the first thing we need to do is drill our hole outside uh so we're gonna go up inside this wall cavity here and run a wire out and then back into the electrical panel so we want to check around real good to make sure that there's nothing in the way so here we have some some uh caulking in the way so i think maybe we should get our knife and probably cut that out of there just stop the video for a minute get a hole cut we can pull away the insulation up inside the wall here make sure that there's nothing in the sill plate when we go to drill out and the sill plate is clear there's no wiring in there so we're going to come out about the same height as the uh electrical service mask that goes through so we know we already looked outside and measured that there's nothing out there so we'll bang our holo through so now we've got a whole load through we'll go outside and we'll get the wire geared up and stick the disconnect on and cutter so now what we're going to do is we're going to install a disconnect on the outside which can uh turn the breaker there's a breaker for it that turns off and on to go to the unit so these are an outside rated disconnect that we use they have a breaker that goes right in them and we come out the bottom with our whip so in the back here we put a grommet so we can go onto the wire on the side of the house so we'll screw that on first this actually gets screwed right to the hose and then we can go to the bottom with our whip make sure we're level here we'll edit that part [Music] [Music] that's in there must be foam on the outside of the house i think we had long screws yep there we okay so now we're going to strip that wire and do the connections another helpful hint that we do when we're working at these is we just take the top off makes it a lot easier to see what's going on inside and we put it on later it's always a good idea to put a bead of silicone in around that uh where it comes out through that grommet just to make sure nothing gets into the hose now i gotta grab my pliers oh thank you so we do the ground up on the ground and flies are chewing at us today and then we do our two lines up 240 volts red and black on each lug make sure they're good and tight there we go now we'll do the whip the whip is liquid tight flex that we use it's ready for outdoor sun resistant we cut it on the fly and make them up because well they're all a little different when we do different lengths so this one here is i guess about three feet we'll shove our wire through and put our two ends on we just simply take the wire and shove a piece through which will give us enough to get for a connection sometimes it's a little fussy my sidekick there to pull it straight for me man the flies are coming now so what we do is we stick an end on each one of these they're a strain relief connector ready for liquid tight they just twist on and we have a whip and some whips come with the pump heat pumps when you buy them but we like to make these up ourselves just because it's a lot easier then we know what we're doing like i mentioned and then this gets screwed into the bottom of the disconnect and we do our other side of our connections up make sure the lock nuts tighten down and then we'll strip that oh we got a breaker and everything look at that do these connections up the reason we don't strip the wire inside the conduit or the liquid tight we're allowed to go 15 feet by code here before we have to strip it anything over that and we need to look at stripping it so if we do a underfoot run around the outside of a house because we can't get through the house then we have to strip the wire stubborn this morning i heard until it's a beginning of the week all right there's that now the breaker that we install uh has no current rating on it it's just simply on and off and this is for a surface disconnect so the service guys can just simply shut it off they need to work at it so we always match our wire colors up on each side so black was up on that side on online so we're going to do that on our load the bottom of the breaker is the load side make sure that's good and tight and the wiring that communicates between the indoor head and the outdoor head take note of this black wire here it's coming from the indoor head these are the the hvac guys that are running this wire they do the connections between the indoor and the outdoor unit we just did power feed and we do several of them sometimes 20 of these a week depending on what we're doing a lot of heat pumps so i'm going to hang off and put the covers on later because i want to show you with the meter how we check it um so we're gonna move inside take the panel cover off and show you how we put the breaker in for the i'll show you how we put the breaker in for the inside panel cut it there so now we're gonna take the panel cover off and put the wire inside the panel tie the breaker in this is eaten panel quite a common panel where we're from we like these are good for installing have a good trip rating and easy to work with what i was wondering i had the other guys and they said sometimes you have to do it sometimes they don't nope not at all so what we're going to do now is stab the wire into the panel and we need to come through a knockout hole so we'll just look around in here to see if we can find one that is going to work for us and i see nothing on the inside of the panel here so we're going to take that knockout and bring our wire through there we use a gray plastic connector to bring our wire through there we go now the power inside of these panels is all isolated to the bus bars in the center so as long as we don't touch those we're not going to get a shock but boys if you touch them you don't we'll bring the wire down stick it right into the panel want to come over on this one you can probably see better yeah there we go right into the panel we'll get some straps on that here in a minute and then we're going to put our breaker in now the breaker is uh eaten or cutler hammer rated 15 amp remember i showed you outside on the side of the unit it was rated for max breaker size 15 amp and this is double poles so it goes across two poles to get across two bus bars so inside there that gives it the 240 volt we'll strip our wire and i apologize for the darkness this is just a dark basement we don't have much light so we'd be mindful when we strip the wire to look good for other wires around it but we've done this so many times and it's quite easy for us now strip our wire and then we're going to put our grounds in underneath when it come up a little closer we're going to put our grounds in underneath with all the other grounds and then our redner black wires are going to go here on the side of the breaker so we'll stick that in there tighten it down with our trusty impact gun the reason i like to use an impact gun for tightening lugs down is you know they're tight and then we'll strip the wires and put them on the breaker i'm telling you breakfast this morning my guts are growling you'll see i'm doing this with a pair of lines from pliers instead of strippers you just get used to using line pin pliers after a while and you can learn strip wire quite easily damaging it i have to back these ones off they're tightened already get your wire in place give a good tighten and a good tug on it to make sure it's not going to come out you don't want any of those connections because then you get our kink which arching is not good it can cause fire a good tug on it then we're gonna put the cover back on so now when we put the cover back on we need to make two more spots in the cover uh right here on the bottom right hand side so we usually bust these out if you can't do if we can't do it with our fingers then we'll do with our pliers just pop them out and then we can put the cover back on we just line the screws up sounds like somebody's falling upstairs once you get the screws started they're a little tiny to go in but get them in every put time three in on the other side and then mark the panel make sure we always do that and put a couple straps on that wire there and then we'll go outside and show you the voltage rating and that'll be pretty much it december 15 1999 oh that's an old leak so come in a little closer you can see the breaker here um right now i think that's safe to turn on yeah right now um we've got to mark this we'll mark it mini split heat pump living room and then put a couple straps on this wire and uh then that'll be it we'll move the outside you can cut it there yep so now we're going to do a quick meter check on this just to show the voltage whether a meter a pivot point so the one that's already in there we're going to go across our two lugs so we have 246.5 so basically now we can stick our covers back on that's a good point to start measuring from until then if you drill down you drill up before we go so folks we're a little bit ahead of uh ahead of the uh pump installers but we showed you how we wire our heat pumps so don't forget to like and subscribe and we'll see on the next video"

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"VideoID": "515",

"Title": "How to read electrical drawings &amp; wiring Drawing | Control Panel Schematic : Simplest Way | 2022",

"URL": "https://www.youtube.com/watch?v=NYCsV6HG73k",

"Keyword": "Electrical wiring installation",

"Transcript": "understanding of electrical wiring diagram is very critical for control engineers automation engineers plc scada dcs instrument and electrical engineers most of a fresh engineers a newcomer into their respective fields normally have a hard time reading electrical drawing if you're one of them who struggle reading electrical wiring diagram this video is for you we will try to make this explanation easy for you to understand after watching this video you would be able to read any electrical wiring diagram there are main three things of any electrical wiring diagrams one is the legend page what is the legend page you can see right here this is the page which is called legend page which contains different samples and their explanation you can see the motor samples over here this is for motor you can also see encoder sample like that you have different samples this is the step number one that you should have to go to the legend page which would tell you what are the different symbols used in this particular drawing so this is another page which would tell you different abbreviation what is the respective explanation against these abbreviations now let's get into one page of this electrical wiring diagram and understand how to read electrical wiring diagram after having understanding of abbreviations and different samples this is one of the page zoom it bit you will get in here this is the three-phase supply three-phase power supply here is connected to the breaker qf-152 l1 l2 and l3 this is your breaker qf abbreviation is for the breaker one five what is this one five it's very important to understand one five is the page number you can see this page have a number 15. so what is this 2 if you can see here this 2 is the column number every page have different columns in that starting from 0 here this page have 0 to 9 different columns this is column number two that's why you breaker qf one five page and it is at the spot column number two this breaker will provide you short circuit protection and thermal protection if you zoom it a bit you will find the rating for this particular breaker this breaker have a rating between 0.55 to 0.8 ampere other end of the breaker have different whites connected to it which is 1 5 10 1 5 11 and 1 5 12 which is then connected to contactor this km is a contactor and 403 is the number for this contactor and this particular sample is for the contactor if you want to read the control drawing of this particular contactor this is your address for that this first 40 is the page number 3 is the column number so if you will go to the page number 40 column number 3 you will find the control drawing of this km 403 over there don't mix it up for now for this another contactor let's get down and understand how this contactor is then connected to motor then you can see here other end of this contactor t1 t2 and t3 is actually connected to three wires u152 v152 and w152 this m3 is your terminal strip terminal strips have three connection points over here one two three and if you want to see other points here you can see here four five six but we will talk further about that for for now don't mix it up if you go down you got m152 which is motor specific identifier how it comes m for motor 1 5 is the page number 2 is the column number right here this motor is machine head motor this motor is 0.37 kilowatt this is three phase motor and it is grounded let's get into other side of it if you watch our videos regularly then you might understand this concept easily that if you wanted to reverse the direction of the motor you have to change two wires you have to change the connections for that if you see the middle wire which is which is right here this middle wire is connected to the middle wire of this contactor but the rest of the wires are interchanged this wire is connected to l3 instead of l1 this wire is connected to l1 this wire is connected to l1 instead of l3 over here so you interchange two connection by that way you can reverse the direction of the motor and this is another contactor km404 if you want to read the control drawing which we would do shortly you have to go to the page number 40 point four the column number four over here this would be the column number four you will find the control drawing so page number forty column number three this is your page number forty and then you have to go to the column number three so if you go if you go to the column number three you will find the control drawing of that particular km contactor km403 if you see here one important thing km403 is interlocked with km404 by that way you would make sure that motor should not run in forward and reverse direction at the same time so that's why you interlocked it with km404 and then this is the wire tag e1.1 which is connected to the plc card channel 13. the second contacted drawing was at the fourth slot of page number 40. if you go down you will find km404 which is interlocked to km403 which is this so by that way you would make sure that motor should not run in forward and reverse direction at the same time then this wire have a tag a 1.2 which is connected to terminal number 14 of a plc card now let's get back to that page and if you start if you start reading further you will find another connection here which is at the column number 5 of the same 15 number page of that drawing you got another breaker here qf15 is the page number five is this column number so qf155 which is your breaker over here you can see the symbol of that this breaker have a rating 5.5 to 8 ampere rest of the things are similar it is attached to km 3 9 7. if you want to see the control circuit of the km 397 you have to go to the page number 39 column number 8 then it is connected to terminal strip and you you are already aware about the tax of the wire which we already talked the wise tags are 1 5 5 v 1 5 5 you u155 v155 and w155 and then you got motor m155 m is motor one five is the ph number five is the column number and this is three three-phase motor both of these motors are grounded you can see here this is the ground symbol this is also ground this is also ground symbol this is turbine with q motor and this motor is three kilowatt so that's all for today i hope you like this video if you like this video consider hitting the like button if you haven't subscribed this youtube channel consider subscribing until next video take care and allah face you"

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"VideoID": "516",

"Title": "4 WAY SWITCH WIRING DIAGRAM multiple lights (Tagalog) ,Electrical Expo",

"URL": "https://www.youtube.com/watch?v=1jqcMou-dBw",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] hello [Music] [Applause] [Music] [Music] [Music] do [Music] [Applause] [Music] [Music] [Music] hey [Music] do [Music] [Applause] [Music] you"

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{

"VideoID": "517",

"Title": "Installing the electrical conduit like this will surely satisfy you more.#electrician #construction",

"URL": "https://www.youtube.com/watch?v=Z2JreI08oFY",

"Keyword": "Electrical wiring installation",

"Transcript": "installing the electrical conduit like this will surely satisfy you more there's no need to drill through the concrete to install the conduit for those who often criticize me for drilling through concrete beams are you happy now"

},

{

"VideoID": "519",

"Title": "How To Wire a Dishwasher, Dishwasher Electrical Connection, Wiring a dishwasher",

"URL": "https://www.youtube.com/watch?v=ttun\_X7JIAM",

"Keyword": "Electrical wiring installation",

"Transcript": "hey guys this is Dan with the kind of electric welcome back to my channel today I want to show you how to wire a dishwasher that maybe you're gonna get in the future it's not a really complicated process but I want to show you what you do first of all usually the dishwashers are the boxes located right in here in the front and what I did is I flip the dishwasher on on its back and then I'm gonna take this plate off and it off ok so first of all just a few screws here and a bit to the front and take this foot off [Music] so now I'm going to take this plate off from the prong and then in here we have the electrical and then there's the water but the electrical that's in this kind of box will you take this cover off of here take this off okay so we have the wires in here we have two or three wires ground neutral and hot so what we're going to do is you want to take this cable we're going to have a connector that we're going to use so I'm going to take this if you want you can strip the cord a little more so that's what I'm gonna do let's trick this guy a little more because I need more [Music] we make them on the table I just screwed now we're gonna put this cable in put the connector inside there we're gonna take this not down just like that all right okay so now we're gonna connect the cables one thing that I want to do on the strip down the ground roll one expose a little bit more cables I have a better connection so the ground [Music] down [Music] and the hot together [Music] can I sleep in here and then you take the with the cover with this feedback [Music] okay that's secure and there you have it this is your cord right here they're gonna plug in through that hole and your dishwasher is why well thank you guys for watching this video hopefully it was useful for you please leave me a comment being a thumbs up and if you liked the video please subscribe I'll see you in the next one"

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"VideoID": "520",

"Title": "Installing an aftermarket RV fan when no electrical wiring is close by",

"URL": "https://www.youtube.com/watch?v=jlLawC6RjLE",

"Keyword": "Electrical wiring installation",

"Transcript": "here's one related to DC wiring Gary the RV view June 22 June 2009 article obviously I don't write it somebody else did about shurflo air fans I ordered a unit from Camping World and asked them to install it they told me the unit could not be installed as there was no 12-volt wiring nearby can and an add-on accessory such as the shurflo air fans which are great fans by the way they move a lot of air in and out of that coach so that's a good it's a good purchase can it be installed in a vent that doesn't that is not powered in other words there's no wiring up there yeah you have to be able to route the wires up there somehow a good installer a good technician will be able to get the wires up there the positive and the negative 12 volt DC wires chances are he'll have to run a new circuit which is what I recommend because of the power consumption of a powered vent you would want to tie it into an existing lamp circuit for instance because that would overload that particular circuit but a good installer will be able to hide the wire so you'll be able to route the wires up to that ceiling where that vent fan will be located and it's just a matter of concealing them whether you conceal them in the ceiling itself depending on the type of coach sometimes you can fish a wire over to a over to a cabinet and overhead cabinet where you can then conceal it inside the cabinet somehow it is doable is it does it take work yeah it does take a little effort it takes a little bit of talent to be able to hide those wires but it is very doable so Dewayne I would I would suggest that you that you try and find a technician in your area I didn't mention your city you're in Forest Hill California I look for a good technician that has the expertise to be able to install it because certainly it's doable you"

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"VideoID": "524",

"Title": "Is wrapping insulation foil around electrical conduits really necessary?#eletrician #construction",

"URL": "https://www.youtube.com/watch?v=Rz3yox30wzI",

"Keyword": "Electrical wiring installation",

"Transcript": "do you think wrapping insulation foil around network cables when they cross electrical wires is really necessary in my electrical projects for Smart Homes wrapping insulation foil around network cables when they cross electrical wires is mandatory although modern network cables already have internal shielding to prevent interference adding insulation foil helps reduce electromagnetic interference since it reflects electromagnetic waves this helps protect the Integrity of the data transmitted through the the network cables if I don't wrap them with insulation foil they won't pass the inspection by the project supervisors"

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"VideoID": "527",

"Title": "Electrical Wiring-Overhead service wiring",

"URL": "https://www.youtube.com/watch?v=71P8DsVJ4I8",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] good morning Sparky here how are you guys doing today got myself a new headset and wanted to try them out this morning with just a a quick little video here what we have is a 200 amp overhead Mast feed it's coming off the utility pole and these three wires here this singlephase uh residential home and these two wires here are aluminum and the cable in the center there is your neutral it's also aluminum but it has a steel Cable in the side of it called the carrier cable and that's what is tied around the Mast here for support from here to the pole it's about U I don't know uh 4050 ft out to the pole it's not very far one of the things that I wanted to point out was that the insul ERS out here in our Arizona Sun have kind of um deteriorated and fell off they actually found them in their yard and these are actually just a a couple inches away from that uh that neutral there so when the wind gets to blow it gets it gets pretty close to to shorten out this is copper coming in through here it's pretty stiff so it's you know it's not likely unless we get really really high winds that these two things are going to short out but nonetheless I've told the owners that they need to get a hold of the utility company and and get them out here and get these covered up you know it's a it's a safety thing I'd hate for those uh to happen you know in the middle of the night but anyway um just wanted to show you that real quick uh not a big deal hope you guys have a great day and I'll talk at you later"

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"VideoID": "528",

"Title": "Practical Electrical Wiring-MC to Emt Connectors",

"URL": "https://www.youtube.com/watch?v=HhwEwbgZFA4",

"Keyword": "Electrical wiring installation",

"Transcript": "hello everyone it's Sparky today I want to show you the uh I've got a little diagram here of how and why to use a uh EMT to MC connector was a request from one of the viewers and this here here's a EMT to MC connector so let's take a look at this and then we'll move into a video and that uh I'll show you another option to do if you don't have the EMT to uh MC connector so let's go ahead and get started here basically a lot of guys what they'll do is uh go through and rough in all their walls first and a couple different options of what guys do and that I've seen is they'll Mount their switch box on the stud run a piece of/ in EMT up Mount another box and then they can bring their MC later on if they're tying into light fixtures or whatever the case may be um that's good if you have multiple runs of MC going in there home run another EMT home run of uh wire and stuff it's uh serves that purpose but if you just have one MC that you need to take down to your switch the without having to make up a j box and mount that all up and above you can use the emt2 MC connector so really this is just a pretty simple little diagram showing you what it is and in this case here it' be the/ in EMT going up and then you'll have your EMT to MC connector there's several different things that you need to do with that um in order to to all the pieces and parts so I'll put that at the end of the video the pieces and parts and and we'll uh go ahead and move on over to that video right now so see you in a second hello everyone it's Sparky and today I want to uh in this demonstration sobody to ask me what this little thing was for and basically it's a MC to EMT connector so I'm going to show you two different ways to do this um basically you're going to have your box which is probably mounted up against a stud and in this case I've got some uh 122 MC here got just a short piece of pipe just for the demonstration got my MC splitter your anti-short bushing couple EMT connectors set screw and uh a screw in MC connector so what we're going to want to do first off is get some of this stuff out of the way so what I'll do is I'll start off by assembling the Box EMT connectors and the um emt2 MC connector this piece I just cut off with the with my hacksaw I'm using um a Ramer here just run it around there a couple times to knock off the [Applause] burs nice and clean then we'll grab a set screw EMT connector and we'll put it in hole yes I'm using a use box for this demonstration and what we'll do is insert the EMT in there and in the bottom of this Ramer here it's got a little uh standard screwdriver in there so you just slip it over the end and these go from half to uh 1 in on these reamers I used to have the ones that uh put on uh a shaft of a screwdriver but uh I didn't really particularly like that I like these a lot better but that's just a personal preference so the next thing you'll do is slide on your um EMT to MC connector now that we have that done we are going to take the MC and figure out how long it needs to be we want to leave I like to leave about I don't know 8 to 10 in out some people say six but that's just my personal preference and then what I'll do is I'll just take a measurement right about here and I've got that marked and what I want to do is show you the EMT splitter or the MC splitter here and put that down in there you just make sure that it fits in right and then all you do is take it spin it a couple times you'll hear it snap there's other ways to do this uh this is a preferred method I know a lot of contractors that um if you don't have an MC splitter and you're using your dikes or have or something like that um you know that's pretty much um a no no to them you just take this sheathing here and we'll split that off we'll take our anti-short bushing and there seems to be some discrepancy on whether this is code or not I don't think that it is but uh they're sent out with uh the roll of MC so I'm assuming that the manufacturer uh recommends it and so is it a UL listed without this I don't know but uh I use them and I tell everybody else to use them it's just a little bit of added protection some of the snap and MC connectors have their own uh inserts there but in this particular case this is what we're dealing with okay now what we'll do is we will slide this down loosen up all those screws and slide this down into our box and stick it in there and grab our screwdriver it's my new 10in one screwdriver man I love these things just so much easier to carry these around you got standard fillips you got your number one Phillips and smaller standard there that's a nut driver uh 5/16 it looks like uh we'll go ahead and tighten this up you don't want to get it too tight as to crmp and pinch the MC let's go ahead and tighten that up kind of go like that a little bit so basically that's all there is and that's the purpose of this EMT to MC connector various different reasons and uh I think I explain that in my uh my photo before we started the the actual video and stuff but anyway um that's basically it and the it's it's just a a faster way than mounting a whole new jbox up here you don't have a cover you don't have another ground screw you don't have more connections and everything else this pipe could be 10 ft long it could be 5T long whatever your application is but uh that's what that does so let's take an look at an alternative to these fittings um if you don't have access to these or order them or anything else there's another way that you can do this and what we'll do is take another EMT connector and then we'll take a half in GRC coupling thread that onto the connector and we're not going to tighten it down yet and I'll show you why in just a second depending on where you're at and your your application what you'll do is just take off the uh lock nut off uh this Style MC connector loosen those up a little bit I know a lot of people use drills on these I don't recommend it mainly because when you go to tighten these down you can crimp these wires so bad that they'll end up shorten inside the the wire even with an anti short I've seen them where they they trip out but to slide the MC connector over don't forget your anti short notice how I turn the split the opposite direction at least that's how I was thought you guys might do it different and then we'll slide that up and we'll go ahead and tighten this up a little bit you'll see here in minute why I didn't tighten up that EMT connector I have that secured right fire nice and secure you see the little you can see the little anti-short in there some inspectors look for that at this Point that's still not tight but I'll pull that through and here's the reason why I don't do it is rather than turning the MC and trying to spin the connector around and stuff like that I mean you can do it but this is just the way that I do it and take this and then now you can turn this tighten that up good and snug now you can take your screwdriver or your Ramer tighten that up and there you have it so that's the two different types of uh MC to EMT connections for various reasons um you know mainly not having to make up another boxes and uh blank plates and all that stuff so hope this helped you out guys and uh everybody have a great day and I'll talk to you later for"

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"VideoID": "529",

"Title": "Installing A Wall Oven Electrical Wiring (Electro On The Job)",

"URL": "https://www.youtube.com/watch?v=YsxaTKwHqag",

"Keyword": "Electrical wiring installation",

"Transcript": "welcome to another episode of electro technology on the job and today we are looking at installing a oven a hot plate and a couple of lights all in an apartment which will provide its own set of difficulties and interesting things to look at so please continue watching and see how we go [Music] so most apartments you'll find the circuit breakers actually in the closure somewhere hidden away in this case it happens to be here in this cupboard so if i go to the cupboard you can see there they are there and i can then isolate the circuits i need to isolate in this case it's going to be the oven because i remove the oven and then when we need to do some work on the lights we'll isolate the lights go through our seven steps of isolation and that way it's all safe for us to work on on the apartment you're working in depends on whether they're going to be inside a cupboard or maybe they're just inside the doorway sometimes they're in the laundry it will all depend you'll just have to have a look when you're out there working on the job all right let's get to it so this is one of the lights that we actually need to take down it's attached to a concrete ceiling so you need to keep that in mind whenever you're doing this kind of work that you know you're not going to have a plasterboard ceiling or something that you can actually access there's no access and just see sold the concrete so i'm just going to disconnect the wiring that goes into the back of this light fitting here i'll disconnect the active earth and neutral and then this has been held up literally there is a j box a junction box inside the concrete which was put in when they were pouring concrete and literally this is all that's holding this light fitting to the ceiling so when we put the new light fitting up we may need to adjust a little bit we may need to drill a couple of new holes and screw into the concrete or somewhere to try and attach it so we'll take this apart [Applause] [Music] [Applause] [Music] okay so this light is actually a little bit different most light fittings you put your stripped terminated wires into a terminal strip and you tighten up with screws but this one's different this one literally has some sort of push-in mechanism so they've stripped the wires they've pushed them in and it's grabbed hold of the wire and won't come out so the only way i could get this off was actually cut the wiring off which is not ideal because now i've got to restrip the wires and if you were to do that numerous times then your wiring is going to get shorter and shorter and shorter so yeah there you go um first time i've actually seen that a first for electro technology on the job all right well light fittings off now i can get the new light fitting organize it there is one spot here where they've drilled in and they put a green roll plug into the concrete and obviously there's spots here to screw into the junction box which is inside the concrete so we'll get a new light we'll put it up so this is the new light fitting that's got to go up on the ceiling but obviously because it is a concrete ceiling then i need to drill some other holes to hold this up so what i'm going to do is i'm going to drill one hole through the base near where the entry point for the cable is that will allow me to put a screw into the junction box sitting inside the concrete slab that'll hold it in place and then i can just drill another hole somewhere and i can then screw that into the concrete using a green wall plug and away we go when you connect in the new light fitting generally i find it a little bit easier to do the wiring wire it in actually first before i actually mount it to the ceiling and that's really for two reasons one it allows me to create a little bit of movement if i'm trying to work with only short mouth cable and two it also allows it to hang by the cabling if i need to muck around to adjust to get it to actually sit correctly on the ceiling as well so just a little tip there [Music] now this is this is old wiring so it's got the old bare earth which now actually has a green plastic sleeve just slid over the top of it you'll find this in a lot of older buildings that's the way things were done many many years ago we don't do that anymore obviously now it's all insulated earth all the way through regardless of the building all the jobs have been done [Music] so i'm putting the screw through the hole that i drilled into the light fitting this will then line up with one of the mounting holes in the junction box that's sitting in the concrete and i can tighten that up hopefully without any too many problems i've had to use a little bit of a thicker screw simply because i don't have one that fits exactly into the mounting block but this should do the trick and once i've got this pretty much where i need it to be then i can just mark out where i'm going to drill a hole into the concrete and i can drill that hole mount that and it's done [Music] now if you can find your way to way to make your life easier always do it there's a hole here and it's going to match up almost exactly where that existing hole was in the concrete so i'm just going to drill another hole into this light fitting because easier to do that is to drill into the concrete and then i can just screw straight in think ahead [Music] the next slide i may not be as lucky as i was with this one but you never know there we go that is starting to sit nice and solid as solid as it can be obviously on this particular ceiling it's quite a flexible light filling once i put the diffuser over the top it'll be good it's not going to go anywhere there we go that's good now i've got another light to do and i'm going to repeat the same process so i'm going to go away and do that light then we're going to come back and have a look and see what job looks like then okay so i'm at the other light fitting and i've just come across something interesting that you need to know about when i've gone to disconnect my cabling on this side there's actually two black wires remember you should have a red black and green right red being active black being neutral green being earth and in this case there are both black ones one is active one is neutral which one is which you could do a test you could get your multimeter out and you can test we can work that out really quickly and easily see which one's which we can also do a visual inspection in this case if you know how your circuits work then you'll know which one's which i have two black ones twisted together and one black ones that's single the single black one is my switch wire because the two that are joined together are looping to the next light in the unit so i can tell just by looking at it but that's something that you need to be really aware of you're going to come across that in a lot of old buildings where they used to use black as a switch wire and sometimes they'd even use black as actives which they probably shouldn't have done but they did because the rules actually stay you can use any color at all for any cabling as long as you only use the green for earth so it could be any color even if it doesn't seem to meet any standards that's the way it is so knowing that when i take this off it's going to make sure i always keep the neutrals and make sure they're twisted together tight they don't come apart because they come apart then i've got to try and figure it out using my multimeter but if i keep them together then i know that yes they are definitely neutrals and the other one is my switch wire all right [Music] okay so i've had to do some adjustments on this light fitting here i've had to put a new hole entry hole in for the cabling and the reason i've had to do this is because when they put this j box into the concrete they would have been working off the floor plan and they put it in the center of the room but then what has happened as the the apartment's been built they've been built in these cupboards and they've built all this in added in and this is now no longer in the center of the room so this is why knowing what's on your floor plan and knowing what's going to be installed later on is really important if they had known at the time all of this covering was going to be installed then they probably would have moved this junction box over across and make that more centralized it is what it is you can't change it now because it's in concrete so what i've had to do is add that extra hole so i can put the light kinda offset but what has happened is because i've done that the wiring coming out of the junction box is not long enough so i need to extend it so first thing is drill a hole the next thing is that is metal and there's obviously going to be sharp edges around that so i've tried to clean it up as best i can but i really need to put some sort of pushing over that and the trick to it is grab a bit of tps cabling take the wire out out of tps gives you just the outer sheath and then you can put that in into your light fitting and it'll just sit on there nicely it's a little bit of fiddling around initially getting it on but once it's on that'll create a bushing around the hole and then you're good to go just like that nice nice shroud now cable can go through there without being nicked or damaged by the sharp edges of the metal perfect now to extend the cable so all i'm going to do is just get some wire attach it with a bp connector or a screw connector tape it up tuck it back into the box there and then those table ends will be those then those cable ends will be long enough to reach into the light fitting wire light filling up screw it up just like we did with the other one and hopefully that's it [Music] [Music] remember always put a double screw connector on your earth that is as per the australian standards and obviously tape up all of your connections as well [Applause] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] okay so there is no way around it i have to drill into the concrete for this particular light fitting um you always be really really careful when you're doing this because you don't know where the conduits are going and you don't want to hit a conduit that could be in that slab somewhere so always take your time check to see if you can see any direction which cable's going that from the junction box you'll need and then just take your time drilling through that way you don't hit anything cause even more problems [Music] so [Music] light fitting is up that's two light fittings done that's it let's continue on so this is the wall oven that we need to remove and on top of it is a glass hot plate so to get this apart the really easy way to do it is that wall oven has to come out first and if i open it up there's actually a couple of screws on the edges so i undo those two screws and then this whole thing should slide out and there should be enough cable behind there to extend it out and we disconnect once we've got this apart we can take it out then we can access this because the hot plate will be held together by some clips underneath so when we undo those clips we can then just lift that off tip it over disconnect the power cables coming in and we can get the new one and we can just put it all back together in reverse order really that simple so let's see how well we go getting this out [Music] [Music] [Applause] [Music] okay i've got the oven out and what we've discovered is the hot plate is not independently wired now what i mean by that is this this hot plate has a plug on it which plugs directly into the oven and most ovens and hot plates come separate and you wire them in separately so it means we're gonna have to apply some more cable can get some more cable and the new one because new one's not like this at all so that we can wire the new one in directly as well as the back of the oven now to get the oven apart or get it disconnected there's actually a panel down here that i can just take a couple of screws off this will come off i get my terminal strip and disconnect it and away we go so that's what we're gonna do okay what you can see here is this is a two-phase oven so i have two active cables one of these will be phase a one of these will be phase b and then i have my neutral and my earth so the phase it doesn't really matter which phase goes on which either way now the new oven may or may not be two phases and i believe the new oven is only a single phase so one of these phases we actually won't need anymore and we may probably we'll piggyback the second phase we'll use that for the for the hotplate so we're going to disconnect this always double checking making sure that it is definitely de-energized we've gone through our seven steps of isolation so we know that's now the case so i'm going to take off phases first and leave the earth there the earth is there to protect me now the way this has been put on it may be difficult to see but the way this has been put on is the wires have been twisted and twisted around the termination screw and that is quite normal that's the way we actually do this so again goes onto the terminal strip like that and holds in place so let's take them off so as i mentioned this top here this stove top should have some clips underneath the bottom um i've just had a look and discovered it has no clips on the bottom it's actually just sitting there there we go so it just pops out like that there we go one less hot plate now we can get ready to wire in the new ones so the stove top has to go in here does not fit the new one so if you have wondered why you need to learn carpentry skills as an electrician this is why because now i have to take a jigsaw and i have to cut out this bench top at a slightly larger size and i've got to be really careful because i only have a fine tolerance because the lip of the new hot plate is only about 5 10 millimeters at best so i don't have a huge amount of tolerance for me to cut so i've got to be really pretty accurate with this when i do it this is why it's so important to have all those extra skills so those plumbing skills those metal skills those carpentry skills all those other trades this is why electricians need to use them because we have to do this sort of stuff all the time so we're going to cut this bench top and hopefully the new stovetop will fit nice and snug always wearing your safety equipment when you do this make sure you've got some glasses on [Music] [Music] hey [Music] when wiring up the hot plates you'll find there's usually a wiring diagram because the termination points won't always be super clear so on this one there is a actual wiring diagram here so i'm just looking at that comparing it to this so i make sure i get the correct connections [Music] in [Music] i have to make a join in this cable and i'm really trying to think of a way of avoiding making a join because this is coming out of a concrete wall so once i cut it back that's it there's no pulling in another cable so i'm trying to think of a way that in the future isn't going to become an issue but at this way the way i'm looking at this there doesn't seem to be any other option other than to make a cut and join it because i've got a single cable coming out the wall the old oven had a plug going from the oven to the hot plate this has got separate installations which is way it's usually done um so yeah i've got no choice i have to do that way and it wasn't isn't my ideal way of doing things but this is just the way it's gonna have to be so we're gonna make a cut we're gonna make a join and put it all together and then done [Music] okay so this cabling here that i've been stripping this is a slightly different type of uh plastic sheathing and it's because it's basically has a higher temperature because it's gonna sit behind an oven so i need to join these cables and then what i'm gonna do is i need to put a little bit of conduit flexible conduit over the cabling that goes to the hot plate just to protect it these will then get tucked out of the way up against the concrete here as best as possible there's not a huge amount of room between the back of the oven and the concrete ideally we'd box it toss it in behind inside the wall but this is not going to be the case because it's solid concrete so we'll just do the best we can and get it out of the way so it's not going to be affected by any heat from the oven [Music] [Applause] [Music] thank [Music] me [Music] [Applause] [Music] down okay that is it for this episode of electro technology on the job we have a working hot plate we have a working oven and we have two working lights it has been an interesting job some things didn't quite go to plan but we got through them and we figured out ways around them the biggest issue we had towards the end there was just trying to get the oven actually in the oven when it was sliding in was just tilting a little bit and towards the back there was a timber rest that was hitting the timber rest and wasn't sitting on top so we had to kind of fiddle around and lift it and bit of mucking around you're going to find these things will happen all the time again this is why we learn all these different skills as electricians not just how to wire things up we need a whole range of skills i hope you've enjoyed this episode it's been tiring if you enjoyed it please like and subscribe and i'll see you next time [Music] hey [Music]"

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{

"VideoID": "531",

"Title": "MCB changeover connection#shorts #electricalwiring",

"URL": "https://www.youtube.com/watch?v=mrvamLLNxjY",

"Keyword": "Electrical wiring installation",

"Transcript": "foreign [Music]"

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"Title": "How to Read Electrical Drawings | GET YOUR COPY of the Schematic Wiring Diagram",

"URL": "https://www.youtube.com/watch?v=c8bD59Q2Rv8",

"Keyword": "Electrical wiring installation",

"Transcript": "hey guys just before we get into reading this \nelectrical schematic diagram I've actually   produced a workbook which includes a copy of the \nschematics we're about to reverse engineer if   you wanted me to send you a copy which will help \nyou follow along as I explain them in this video   there's a link in the description where I can \nemail them to you and just a heads up guys you'll   receive a few more emails from me over the next \nweek with some information on a training academy   for automation Specialists that I'm currently \nworking on and the focus of this training   academy will be helping people develop the skills \nand knowledge needed for them to progress into   the Automation and controls industry of course if \nthis is something you're not interested in that's   absolutely fine just make sure you unsubscribe \nafter receiving the initial schematic workbook   so just a quick intro to the project these \nschematics are from firstly this is a genuine   school refurbishment project brought To Us by \nan electrical contractor who's asked us to do   the HVAC and and BMS control upgrade the original \nTrend system was installed back in 2000 which is   obviously pretty old and in need of an upgrade we \npropose KNX or locks on as a new control system   the nice thing about KNX and locks on is these \nmanufacturers make it much easier for people to   buy their hardware and access their programming \nsoftware whereas Trend rightly or wrongly is a   little bit more locked down now as this site's \nabout a five hour drive away from where we're   based it was far easier and more practical for \nus to reverse engineer these original schematics   to get an understanding of the current system and \nhow we can improve things before visiting site and   that's exactly what I'm going to run through with \nyou guys now breaking it into manageable steps so   in this video I'm mainly focusing on the controls \nto understand the logic behind how the system has   been designed and this tends to be where most \npeople struggle to follow the schematics which   is completely understandable but this part 9 \ntimes out of 10 is always the most critical in   understanding the system but before we do that \nlet's have a quick look at the schematic as a   whole and try and build up a picture in our head \nof the project as a whole so page one we can see   that it's a three-phase supply we've got a trend \nout station which is ultimately the PLC we've got   some temperature sensors out in the field and \njust just to point out on every page we've got   this horizontal bold line which is basically the \nDivide between what's in the field and what's   within the panel so this side is obviously \nout in the field and this side is within the   panel so page two we've got our Trend out station \ncontinued and we've got inputs on this page again   which are digital this time so you can see we've \ngot push buttons and we've got contacts and then   we've also got outside of the in the field is a \nheating pump DPS which is a differential pressure   switch page three we've got our Trend out station \nor PLC continued and on this page we've got output   so the first one to look at is these srmvs and \nwhat these are is their Trend relays which take   a naught 10 volt signal and can convert them into \na digital relay output signal so we can think of   those as just relay digital outputs and then the \nother two channels here 39 and 37 they're giving   out a 0 to 10 volt DC signal to boiler one and \nboiler two and if you're interested to learn why   the boilers take a 0 to 10 volt signal there's \nmore information within the workbook on page   14. so page four this is where the 24 volt AC \nand 10 volt DC controls start and this will be   the focus of this video so we're going to come \nback to this in more detail but we've also got   a fire alarm signal we've got a pressurization \nunit and we've got a gas valve signal page five   is controls continued we can also see that there's \na pump there and there's a pump here so two pumps   and more details on the boiler control and then on \npage age six we've got some more controls and we   can see here there's two more pumps and controls \nfor the water heaters within the school so as a   quick recap the devices in the field the system is \ncurrently monitoring or controlling comprised of   10 temperature sensors one pump differential \npressure switch can never say that right two   boilers a fire alarm signal one pressurization \nunit a gas valve closed signal four pumps and a   non-off signal for the school water heaters now on \nto the fun bit let's start reverse engineering the   controls to understand the control philosophy and \nultimately how the system has been designed just   a quick one guys if there's components within this \nschematic that you're not familiar with or that I   haven't explained in much detail if you visit the \nworkbook you'll see on the legend Pages it goes   into more detail of what these components are \nright guys let's get into the controls then and   the first place to look at is the Transformer \ntransforming the voltage from 240 volt AC to   24 volt AC and what you'll also see is that I've \nhighlighted parts of the schematic into relevant   group colors to help you understand what device \nis relate to each other within the schematic so   let's start with the green components and in \na nutshell this little subsystem ultimately   protects the 24 volt AC circuit and indicates if \nthe control circuit is live or the fuses tripped   so we've got our Transformer here 24 volts on this \nside zero volts on this side and if everything's   good with the fuse this MCB here is actually a \nfuse the voltage can travel down here across here   and then two things happen at once we get ra relay \nenergize that's the coil of the relay and we also   get the control circuit live lamp light up and if \nwe go back to the top here as you can see this is   RA we go back up here this is also ra and at the \nsame time we've got 24 volts over here going to   this point here and this is a normally closed \ncontact so when that MCB is good it's closed   and energizes ra which then because this is \nnormally closed opens it not lighting this control   fuse fail so quick explanation of the relays \nthat we see in this schematic before we move any   further so like this relay here ra1 what that's \ntelling us is we've got a box there the name of   it is r a okay and then one is telling us how many \npoles are associated with it so straight away we   know that there's in this case one thing being \ncontrolled when this energizes and we can see   that over here is normally closed contact of RA \nand it tells us this is pole one let's have a look   at the yellow subsection now and this indicates if \nthe fire alarm is active and then it prevents the   24 volt AC control voltage getting to any other \ndevices in the panel so if we zoom into the relay   we see three things happen off the back of this so \nthree poles on R1 so the first poll is r1-1 here   the second pole is R1 Dash two here and then up on \nanother page up here is r1-3 if we stick here for   now this is the signal into the PLC to tell us \nthat the fire alarm is activated so let's have   a look at the yellow control subsystem for the \nfire alarm so what we've got is we've got 24 volts   going down here it's leaving the panel through \nthese terminal blocks and it says here fire relay   open on fire so when there's a fire we don't get \nanything back here which means that this R1 does   not energize so doesn't energize which means that \nit stays in its normal State and if we have a   look over here we've also got 24 volts spurring \noff this point here which goes here and in its   normally normally close low State when they're \nis a fire current or voltage passes through this   normally closed contact and activates that fire \nalarm light and at the same time we'll also get a   signal into our PLC now when there's not a fire \ncontinues to travel through here back into the   control panel and it does energize R1 so what that \nmeans is at the same time the voltage over here it   goes here and now this is open so nothing will \ntravel to This Light here and it won't light up   and because this is normally open over here this \nwill now be closed which will mean the voltage   can travel along here and get to this point now \nlet's have a look at the orange subsystem so just   in a nutshell this subsystem indicates if the \npressurization unit is in fault and it prevents   24 volt AC control voltage getting to any other \ndevices within the panel so just on the power   side which is pretty simple we got single phase \nSupply powering the pressurization unit live in   neutral so on the control side providing we've \ngot no fire alarm this will be closed which allows   voltage to flow down here which allows us to pick \nup on this leg a 24 volt voltage going into the   pressurization unit now this is most likely number \n20 is the common of an internal fault relay and   then it comes out on 22. so it will come back on \n22 back into the panel Terminal 7 and and connect   to the coil of this relay R2 and we can see R2 has \nthree poles so three things will be happening when   that relay energizes so when the pressurization \nunit goes into fault and just for clarity this is   the zero volt side over here so you can see on \nthis line here everything is zero volts so the   first pole on that relay is this one R2 two slash \none which is normally open so if there isn't a   fault the voltage will continue down the schematic \nthat's the first thing the second thing is because   this will be energized and this is normally closed \nit will be open so no voltage will flow to this   fault light and the third thing that happens on \nthe third pole is a signal into our PLC to tell   us that the pressurization unit is in fault so the \nnext bit let's have a look at the red subsystem   and in a nutshell this indicates if the gas valve \nis closed simple as that so providing there's no   fire we've got a voltage coming down here and then \nwe're picking up over here coming along here down   here and then we're going out of the control panel \nto this gas valve and then back into the panel on   this terminal block to firstly this relay R3 and \nsecondly this light so if the gas valve is closed   which will mean that there's no gas getting to \nthe boilers this will be closed which will mean   the voltage will be able to energize this relay \nthis is zero volts again and also bring on this   light on the front of the panel but remember \nwe've also got this one pole of the relay which   is doing something so let's have a look at that \nand that's back up on page two and again that's   a signal being fed into the PLC to let the PLC \nknow that the gas valve is closed which we want   it to be open right onto the light blue subsystem \nand in a nutshell this is a push button on the   front of the panel for an engineer or operator to \npress which then bypasses the automatic control   programmed in the PLC for X number of minutes \nand this allows Engineers to test all service   systems but also allows manual control if the \nelectronics fail so just looking at the relay   to start with re relay Mr and we can see that it \nhas eight poles so eight things happen when this   relay is energized so firstly let's have a look \nhow that becomes energized so if everything's good   and the fire alarm's not on we've got voltage \npassing down here and then if there's no fault   with the pressurization unit we get voltage then \nto the rest of the system including this manual   operator switch so we've got voltage there and \nthen we've also got voltage into this timer relay   T1 this is obviously the manual push switch and \nthen also to the contact within the timer relay   so the manual operation someone would come along \nand press that button which would then trigger   this timer relay which will close this contact \nhere allowing voltage to then energize Mr with   eight poles on it and this is zero volts so let's \nhave a look at some of the things that happen once   this relay is energized so let's have a look at \nit in its normal State without that Mr relay being   energized so no one has pressed that button so \nwhat we've got is we've got our 24 volts coming   across here and then our digital output this is \na relay but it's being used as a digital output   by the PLC let's say it's closed so the voltage \ncontinues through here in Mr relays normal State   and then it stops here at the auto off switch \non the control panel door so providing that's   in Auto that's closed and allows the voltage can \nto continue down to this normally closed contact   of this thermal overload and that then energizes \nthis contact and also brings on the Run light and   at the same time sends voltage out to this motor \nin the field and Powers it if we go back a step if   this thermal overload had tripped that would mean \nthe voltage would stop up here because that would   be open and it wouldn't energize C3 or this run \nlight but at the same time because the normally   open contact over here would now be closed we're \npicking up 24 volts here as well that would then   allow that 24 volts to pass through the normally \nopen contact which is now closed and bring on that   trip light so if you remember what I said about \nthis functionality allowing Engineers or operators   to put the system into service or test mode \nwhich overrides all the PLC Electronics so let's   say that someone's pressed that button so that \nbutton has been pressed and this Mr relay is now   energized we got 24 volts again and now it doesn't \nreally matter if this is open or if it's closed   because this Mr relay is now energized which means \nthat that's no longer in that position it's now in   this position which allows a constant flow of that \n24 volts or a constant flow of current to bypass   the PLC controls and then get to again the or auto \nswitch on the front of the panel so now it's down   to the user or operator engineer to then control \nthis heating pump in the field just through that   off or auto switch on the front of the panel and \nthen the same principles applies down here what   we talked about a second ago and it's exactly the \nsame principles across the drawing with that Mr   relay the same thing happens so you can see it on \npage five as well you can see it on page three and   we're going to a bit more detail about page three \nin a bit and also we've got a poll the eighth pole   going into our PLC to tell us that yes in fact we \nare in service mode so we've pretty much covered   everything now on page four we come back to the 10 \nvolt DC power supply a bit later so let's move on   to page five now so the next thing to look at is \nthis little pink subsystem and if you look closely   actually there's nothing happening in terms of \nthe controls with this little subsystem if you   you look here it said that there was initially \nsome differential pressure switches designed in   but they were emitted but there's still controls \nin place in the panel for future use if people   wanted to add them in so let's just have a look \nat how that operates anyway so we've got our 24   volts coming down here spurring off here and then \ngoing out of the panel on terminal block 12 and   this is where the differential pressure switch \nwould be installed and then it would go back on   11th but in this case we've just got a little Link \ncable which is allowing the car to flow straight   back and energize R4 R4 is constantly energized \nproviding there's 24 volts getting to this part   of the schematic and then zero volts here so that \nbeing energized then brings in this normally open   contact so you see it's open at the moment that \nwould then close and it basically bridges that   gap between the off auto switch on the panel and \nthe coil of R7 relay and this off auto switch is   the control for the control of the boilers right \nlet's have a look at the purple subsystem and   this is exactly the same for boiler one and boiler \ntwo very simple and all this is is a fault output   from the boiler which comes from the boiler into \nour panel and then if there is a fault this will   energize and at the same time will light up this \nfault lamp and then we're going to zero volts down   here and we're also using one pole of that relay \nand we're not using it for bringing that light on   we're actually using it back at the PLC to tell \nour PLC that our boilers in Fault the next little   subsystem is this dark blue one and it again \nit's the same for both of the boilers and this   is basically the run signal for the boiler so what \nhappens is when the boiler's running we've got a   signal coming from the boiler going to this relay \nenergizing it and then it looks like the zero   volts is at the boiler so if that's energized that \nwould mean that this contact comes in so 24 volts   goes through that normally open contact of relay \n6 and passes down to this run light then goes to   zero volts so that's the first thing but we've got \ntwo poles of that Relay first one's there second   one you probably guessed it is a signal to our \nPLC to let us know that the boiler is running next   thing is the gray subsystem and this is really \nsimple so as I mentioned on the last bit is we've   got 24 volts coming down here we're going through \nthe off auto switch for the boiler control so the   switch on the door will be closed as mentioned \nrelay R4 is permanently energized which closes   that contact which Powers up or energizes R7 and \nthis is only one pole being used on this relay   so if we go back up we can see that this pole was \nbeing used up here for the 10 volt DC control to   the boilers so at this point that would be closed \nthis allows from Channel 39 a 0 to 10 volt signal   to then travel through Mr and through this now \nclosed relay 7 and off to the boiler control   and then the zero volts is being picked up over \nhere there and along there and whilst we're here   let's have a look at the Mr relay again so if you \nremember this is the relay that's energized when   an operator or engineer presses the service button \non the front of the panel and that allows manual   control of the system it bypasses the automatic \ncontrol programmed within the PLC so let's pretend   that that's been energized again so no longer is \nthat closed like that it's now closed like this   which means that you've got no control coming from \nthe PLC stops there and you've got control coming   from this line over here which we'll have a look \nat in a sec and then that allows if this is still   engaged allows the voltage to go through on one to \nthe boiler and then back if we look further over   here this is the 10 volt DC signal which is being \npowered from this 24 volt Step Down Transformer   and ultimately going over here powering \nup this 10 volt DC power supply and then   out over here and we've also got the zero volts \ncommon with this Transformer over here so that   allows then a permanent 10 volt signal to pass \nto the controls of this boiler which basically   puts the boilers on Max and that's it guys \nI'll be releasing some more content similar   to this in the future and if you're interested \nin becoming an automation specialist keep an   eye out for those emails about the training \nacademy and I'll see you on the next video"

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{

"VideoID": "540",

"Title": "HOUSE WIRING TAGALOG(PAANO MAG WIRING NG BAHAY)TUTORIAL, Electrical Expo",

"URL": "https://www.youtube.com/watch?v=cez3Idf4QKE",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] hello [Music] [Applause] [Music] [Music] [Music] do [Music] [Applause] [Music] [Music] [Music] so do [Music] do [Music] do [Music] [Music] do [Music] do [Music] you"

},

{

"VideoID": "543",

"Title": "Basic Pool Electrical Wiring Module 1",

"URL": "https://www.youtube.com/watch?v=hNZBtqU5HNk",

"Keyword": "Electrical wiring installation",

"Transcript": "hey this is craig the pool man with pool specialists today we have a short presentation for you on basic pool electrical wiring this is going to be in multiple modules because it's rather complex so let's see how this goes um the first thing we're going to look at is what kind of agenda do we have well i'm going to explain ac electricity then introduce you to ac wiring code the gauges or the sizes of the wiring the different types of the wiring and then some wiring examples all right if you were to look at electricity i like a geek on an oscilloscope this is what it would look like it is actually a sine wave and this sine wave is one sine wave is called one hertz and of course here in the united states we have 60 hertz which means that you have 60 of these every second and if you ever hear that buzzing that common buzzing noise that's exactly what you're seeing or hearing is you're hearing 60 of these in one second if you look this sine wave goes up to a peak and then down to a peak well the peak up here is 170 volts and the peak down here is minus 170 volts well if you think about our electrical it's called 120 volts and so that is this line right here which is what's called the effective voltage it is also referred to as rms or root mean square so when you take your digital volt meter and you attach it to a 120 volt circuit it reads 120 volts because that's what these meters are set up to read not peak to peak but root mean square okay so now the same thing but a little bit different is if we need 240 volts we actually have two sine waves and the one sine wave is 180 degrees out of phase with the other sine wave and same thing my effective voltage on this sine wave is 120 volts call it positive my effective voltage on this sine wave is 120 volts so you add those together and your effective voltage is 240 volts so when you hear on a regular residential system that it's 240 volts this is how it works so you actually have two wires coming in the one wire represents this sine wave the other wire represents this sine wave and very commonly they will split them and you will see a black wire and a red wire okay that would be normal for your household when you start getting into commercial it is called three phase so here we have phase one and that's 120 degrees out of phase with phase two and then that's 120 degrees out from phase 3. so these are all unique sine waves they're all separated by 120 degrees so how does this actually calculate out okay so there's two different types of three phase the first type that we're going to go over is what is commonly used at the commercial and this is called a y connection or a y configuration as you can see here okay so if you go from your neutral to any one of your phases you get 120 volts which would be normal for household voltage but if you go across the phases you only get 208 volts that 208 volts is not enough to run single phase 240 volt equipment so that this equipment will not function correctly or reliably on 208 volts this is very very very important and so if you are trying to put residential or 240 volt equipment in a commercial application you are going to have problems if you have the option to run it at 240 volts or 120 volts you have to run it at 120 volts because at least this way from the neutral to the phase you are actually going to get the correct voltage next is there's something called a delta connection this is sometimes referred to as high lag and this is less common in commercial unless the commercial is in a residential area and then what you'll see is on some of the phases you have 240 volts between them and on another phase you only have 208 volts so if you are running a single phase pump you have to be very careful that you actually connected to two of the phases that are going to give you a 240 volt differential so that that operates correctly because if you connect it to this phase over here which is 208 then that is not going to operate correctly or reliable again you know you go from your neutral to any one or neutral to to your phases you get 120 volts so you also have to be very very careful with this as well because this is your wild leg or your high leg and so therefore you don't want to be connecting you know 120 volt circuit from neutral to this phase so again very very important be conscious you know you need to have a meter you need to be checking your voltages in between your phases and make sure that you've got the correct phase this will work fine if you have three-phase equipment you know you've got your phase a phase b and phase c so if you have a commercial pump or commercial equipment that's three phase this will work fine there won't be any issues with it whatsoever okay code or color code of ac electrical wiring which is very different than dc so your hot wire colors are black which is your most common red and blue if you're doing three phase this is typically what you're going to see you're going to see black red and blue isolating out and identifying each of the different phases sometimes in single phase they'll use black on both the power lines other people will use black and red some people use blue all this is acceptable your neutral color wire is white and so the reality is if i come in and i touch a black wire and a red wire or blue wire i'm going to get knocked on my butt if i touch a white wire technically i should have no voltage there because this is my common this should be it a zero volt level although it can drift depending on what is going on in the system your ground wire is always green and so in your typical circuit 120 volt circuit you're going to have black because you're hot you're going to have white as your neutral and then you are going to have green as your ground when you come into the pool world we have a bonding wire and that wire is bare copper and that hat is connected to your pool shell it's connected to the lights in your pool it's connected to the handle or handrails and ladders in your pool and it goes under the ground it's connected to the rebarb and the concrete and it goes to your equipment pad to all of your equipment including your electrical boxes etc now it is in actuality a separate circuit from your ground however what winds up happening is because your ground is essentially hooked to the case or the metal of your pump it the bonding is also hooked to the case or the metal of your pump through the bonding lug on the outside where the grounding is actually inside with the other wiring okay wire sizes there it's also called the gauge of the wire and the gauge of the wire that you use is dependent on how much current you actually have to draw through it the most common used across the board in the pool industry is 12 gauge wire so the 12 gauge wire if you go with the household type wiring is good for up to 20 amps if you go with the pool type wiring which is over here in the right column it's actually good up to 30 amps um so generally speaking it does not behoove anybody to use anything but 12 so even in a 15 amp circuit you're typically going to find 12 gauge wire you could technically use 14 gauge wire in that 15 amp circuit but nobody ever does it because everybody just uses 12 gauge wire when you start getting up to a 5 horsepower pump that draws quite a bit more current and so therefore most people use 10 gauge wire for a 5 horsepower pump and then depending as you go up in horsepower to commercial grade pumps you're going to have to look at the current draw that you have and then based on the current draw that you have you will depend it you will determine which gauge wire you have when you're running the main into your actual subpanel then you have to be very conscious of the fact that what gauge wire do i have if you're running you know a 60 amp circuit well then you're gonna have to run at least six gauge wire and some people will even step it up to 4 gauge wire so if you notice that this 18 16 were declining as we decline in that number the gauge of the wire goes up okay next is we have household wiring examples so this is not used in the pool industry and you'll commonly see it people that don't know what they're doing may use it this is actually indoor wiring and it's not rated to be outdoor the insulation of this wire is not rated for the types of pumps and equipment that we use in the pool industry even the underground burial cable which is okay if you're running i guess electrical boxes or whatever outdoors we just don't use this in the pool industry it doesn't meet our standards i'm not quite sure you could pass inspection anywheres even with the underground feeder cable and then you also have to remember that the current draw through this is lower than the wire that we use in the pool industry pool industry wiring examples in the pool industry we use a much higher grade wire you can still get this at lowe's and home depot typically we buy it in 500 foot lengths just because it's a lot more cost effective you can use solid wire or you could use stranded wire there's advantages to both we tend to use the stranded wire it does carry a little bit more current and it is a little bit easier to work with in the conduit and getting your wire to where it might need to be it will also require you to have lugs on the end of the stranded wire or preferably lugs on the end of the stranded wire where you really cannot put lugs on the solid wire and that's just going to go straight into the connection then that wire goes through conduit and all the conduit that we use in the pool industry is waterproof so we call this fl this is flexible watertight conduit a lot of people refer this to as smurf conduit and it comes in half inch three quarter and one inch sizes so you would use these connectors on the end of it and they would then get into your junction boxes into your equipment etc and they would keep that watertight connection and also provide a little bit more insulation for the wire that's running through it this way we can customize the wire we're going through it if we need three wires four wires six wires eight wires we can run that through our conduit then this is the flexible conduit and of course we have our solid conduit which comes all the way up to multiple inches and you know this is an example of half inch which would be equivalent to this half inch smurf conduit and then what happens is you use sweeps for your connection there's no such thing as a 90 in electrical because there is no way to get a wire around a 90 degree fitting like you would use in pvc plumbing so you have to use this type of conduit it's going to have these large sweeps you can typically get the wire through three maybe four sweeps max so when you're running this underground keep that in mind you also want to run larger pipe or a lot larger conduit for longer runs so the longer the run the larger the conduit that you're going to use so example is you'll see that in the lights on some of the pools that the better builders will run one inch conduit then that makes it a whole lot easier to pull the light wire through it especially on long poles that might be over 100 feet most of the builders use at least three quarter inch conduit on the lights you really just cannot get away with half inch conduit on lights so this is the hard conduit all right here we have an example of the inside of a pentair easy touch load center and we have just the main wiring coming into it so you'll notice that we have the green wire and that is attached to this lug strip and you can notice that this lug strip is actually attached to the metal of the case then this is actually the bonding wire which goes through the lug and to pass inspection that wire must protrude through that lug at least one inch next we come back here and this is my neutral bar and so i have the neutral wire going into here and these are actually isolated from the ground so this is not connected to the ground it's not supposed to be in older houses a lot of times these things are intermingled and the ground and the neutral are one in the same but the neutral should not be part of the ground and you'll notice that i have the one hot wire going to this lug and the other hot wire going to this lug so you'll notice it you'll see some connections here here here here and here for this hot wire and then for this hot wire here here here here and here that way when we plug in a circuit breaker which we we're going to cover on our next module that you'll notice that it will actually snap into the back and then it will connect to the both sides of that power so you push that in it'll snap in this is a gfi circuit breaker so this white wire right here is going to be connected up to the neutral bar but so you have alternating power or phases however you want to look at that from one circuit breaker to the next or one slot to the next slot so each one of these represents a slot that could take up a circuit breaker if it's 120 volts you'll notice that though you can see the actual copper wire above and below this terminal strip and you'll notice that you could also see some copper wire here sticking out some copper wire sticking out here and some copper wire sticking out here that is imperative that you can do that because the last thing you want to do is be crimping down on the insulation and have a poor connection and if you have a poor connection then the electricity is going to arc the arcing is going to turn into heat the heat's going to turn into a fire so inside this box it would be contained but you would still be damaging the wire and probably the equipment inside this box thank you for watching i hope you found it educational and informative if you did please drop us a like please follow us and have a great day you"

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"VideoID": "544",

"Title": "Star Delta Starter Control Wiring Explained Practically @TheElectricalGuy",

"URL": "https://www.youtube.com/watch?v=vVs\_1oEVMgQ",

"Keyword": "Electrical wiring installation",

"Transcript": "friends today through this video we are going to learn that how to make Star Delta starter friends I know that before this you have seen a lot of videos on Star Delta starter and I can say that with guarantee even after watching those videos you still don't know perfectly how to do wiring of star Delta starter so today through this video we will learn how to make Star Delta starter I will explain the wiring of starter in the easiest way so that you will never forget wiring of startled starter ok then let's start the video as you know that star Delta starter we make in that we have to use three contactors one contactor is for main second contactor is for star and third contactor is used for Delta now contactor we have to start and stop these we use push buttons one push button is there to start and one push button is there to stop this start push button here is no contact and stop push button is NC contact besides motor we have to protect motor from overload we use an overload relay here in Star Delta starter star contactor and Delta contactor both the contactors must turn on one by one that is first of all star contactor will turn on and after some time when Star contactor goes off then install instantly Delta contactor must turn on so here star contactor and Delta contactor to turn on and off these we use a timer friends as you can see here I have a contactor and with this contactor I connected an overload relay this contactor here will be used as main contactor so first we will do wiring of main contactor after that we will do the wiring of star contactor and Delta contactor whenever we are going to do any kind of wiring then before wiring you need to draw a diagram like here you can see I have a star Delta starter circuit diagram in this diagram power supply is there is going to fuse first here I don't have a fuse so I am going to use a MCB after this power supply goes to NC contact of overload relay this overload relay I have we have to use NC contact of this after this power supply goes to stop push button and then to start push button okay then from this face applied to this point let's do the wiring for power supply I am using a 2-pole MCB now from this MCB power supply goes to 95 and 96 number terminal of overload relay so I am using a wire I am connecting this red wire with face terminal of MCB like you can see here face wire is connected here so output power supply we get here so from here we connected a wire and what we will do in this overload relay 95 number terminal of this this one connect wire with this we used 95 and 96 number terminal because these contact are NC contact it means if motor does not trip then in this condition power supply flows further when motor starts consuming more current then this overload relay here it will open the NC contact that is power supply from here will not flow further and motor gets turned off this is why we are using NC contact here now this overload relay here power supply going from this will go to NC push button so I am using a wire I am connecting this wire with 96 number terminal and I am connecting other end of wire with push button now the stop push button here power supply which goes from output terminal will go to start push button so I am using a wire and with this stop push button connect this wire after this take other end of this wire and with the start push button connect this wire now the start push button here on pressing this first of all main contactor should turn on so I am using another wire take one end of wire and with start push button connect this wire take other end of wire and with even terminal of contactor connect this wire Now to turn on this contactor we have to provide neutral power supply also so here what I will do in this MCB here with neutral Supply terminal connector wire I connect it wire here now take other end of wire and in this contactor with A2 terminal connect this wire Now to turn on Main contactor we need face Supply and neutral Supply we're given both the power supply okay then let's check once I turned on the MCB now what we have to do we have to press this start push button I am still pressing this so contactor is on when I release this contactor turned off it means contactor is not holding on pressing it turn on on releasing it turn off now what's the problem here let's understand look in this diagram here you can see this start push button here in parallel to this a no contact is connected this no contact here is no contact of main contactor it means this main contactor here this one no contact of this contactor this one we have to use this in parallel to this push button I am using a wire here take one end of wire and in this start push button with input terminal connect this wire and connect other end with no contact so I am connecting this here now as per this circuit diagram this no contact here wire going from output terminal can go to input of start push button or it can go to A1 of main contactor it will be very easy that we can Loop a wire from no contact to even terminal so I am using a piece of wire and I am connecting this with no contact now other end of this wire will be connected with A1 terminal friends you can see by using proper color coding I am doing the wiring so that it will be easy for you to understand now how this connection Works let's see first turn on the MCB after turning on MCB press this push button when I press this you can see contactor is turned on it means holding circuit is working here Now to turn off this we have to press stop push button moment we press this contactor will turn off so friends we made the Dual starter here now this dual starter here how to convert this into star Delta starter let's understand what we have to do this push button here when we press this timer must also turn on so here what we will do this start push button here with output terminal of this we will connect one wire and take another end and connect with A1 terminal of timer in this timer at A2 terminal we have to give neutral power supply so I am connecting this wire here after this take other end of this wire and with neutral power supply here Loop this wire with this terminal okay then let's check again by turning on power supply so here I turned on the MCB now I am pressing this push button as you can see timer is turned on and along with this contactor also turned on right now you can see Delta indication is glowing at the starting when we turned on Star indication is glowing right now after some time Delta indication starts glowing this timer we have through this timer to convert from start to Delta it will take 500 milliseconds delay time if you want to reduce this then by rotating you can reduce this I am letting this as 500 milliseconds after this this knob here for setting time through this after how much time star is to be converted into Delta that time we can set here if I want to change this to 15 seconds then I will select 15 here if I want short time then I can reduce this now this timer here through this timer we are going to turn on another contactor I mean star contactor and Delta contactor will be turned on through this timer how they will be turned on let's understand look this timer we have in this timer you can see terminals here two number terminal one number and three number this two number terminal you can see here this is our common terminal it means here you have to provide phase Supply after this this one number terminal this is NC contact and three number terminal is of anal contact so first of all what we have to do this even terminal here Loop one wire from here and connect with two number terminal it means that common terminal we are going to connect phase Supply so I am using this piece of wire for looping now what we have to do this timer here through NC contact of this we have to turn on Star contactor we will give power supply through NC contact of star contactor because first of all we have to turn on Star contactor but in between we are going to use an interlocking also what kind of interlocking need to be used look here this is our timer we connected face Supply with this you can see the space Supply is looped till here with the common terminal of timer we Loop the wire here these upper side terminals are common terminals now from NC contact of timer power supply which goes it will go to NC contact of Delta contactor it means this Delta contactor here NC contact of this here NC contact is not there so I am using a atom Block in this Adam block there is a NC contact so what we have to do with one number terminal connect a wire take this wire to Delta contactor and with NC contact this one is NC contact connect this wire with this contact now what we have to do with output terminal of NC contact Loop a wire and in the star contactor with A1 terminal connect this wire so I am using this wire here connect one end of wire with NC contact and connect other end of wire with A1 terminal in this way this phase Supply Here of star contactor is not connected directly with even terminal of star contactor because we have to interlock here at a time only one contactor must remain on now this contactor here to operate this neutral power supply is also required so to provide neutral power supply what we will do in this timer at A2 terminal neutral power supply which was connected with same terminal connect one more wire now take other end of black wire and with star contactor connect neutral power supply so here to turn on Star contactor we provided phase Supply and neutral Supply now connections we did here let's test this once for testing turn on the MCB after turning on MCB I am giving start command now when I give start command you can see Star contactor turned on after some time I mean after the program time star contactor will turn off and Delta contactor will turn on here Delta contactor didn't turned on because we did not done the wiring of this to turn on this Delta contactor let's make a circuit for this also what we have to do in this timer there is a no contact I mean with three number terminal connect power supply and take the supply to NC contact of star contactor here I don't have NC this is why I am connecting Adam block with this take one end of wire and connect with no contact of timer take other end of wire and in the star contactor with NC contact connect this wire now in the stock contactor from NC contact take output power supply and in this Delta contactor with A1 terminal connect this power supply here I am using this yellow wire connect one end of yellow wire with NC contact of star contactor and connect other end with A1 terminal of Delta contactor now we have to connect only one wire to this Delta contactor we have to provide neutral power supply for providing neutral power supply what we have to do in the star contactor neutral Supply we connected before with this Loop a wire take this wire and in Delta contactor with A2 terminal connect this wire so here we made Star Delta starter okay then let's test this first of all turn on the MCB after turning on MCB if you want to turn on starter then we have to press Start push button you can see Star contactor is turned on now after some time after the time we set here star connector will turn off and Delta contactor will turn on you can see Delta contactor is turned on and star contactor is off now now this Delta contactor will remain on until we do not press stop push button when we press this our starter will turn off when we turn on Star contactor is turned on after some time Delta contactor will turn on now here understand one thing this interlocking we did here what is the benefit of this look if by mistake star contactor turn on I am pressing this when we turned on Star contactor Delta contactor turned off similarly a star contactor is on and by mistake Delta contactor turned on then in this condition star contactor will turn off friends this is why interlocking is done here so that both the contactors must not turn on together like you know that if somehow both the contactors turn on together then in your starter blast may take place I mean there can be short circuit this is why we do interlocking here friends I hope you like this video If you like this video then please do like share and comment on my video and if you didn't subscribe my channel yet please subscribe thanks for watching this video"

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"VideoID": "546",

"Title": "What are the correct electrical wiring colors",

"URL": "https://www.youtube.com/watch?v=aLSnHRJ3JoA",

"Keyword": "Electrical wiring installation",

"Transcript": "hi there uh just I get a lot of people ask me the different types of wiring colors for electrical wires so I know it can be a bit confusing sometimes so decided to make this video just to for a quick run through so here we've got a standard bit of twin and Earth cable it's 2.5 normally use for sockets and dishwashers that type of thing uh no I've got here I've got a blue core a brown core and an earth core this Earth core is sleeved it's Bit of Earth sleeving if you have a brand new bit of wire just comes with a bare Earth so electrician installing it is supposed to put a bit of Earth sleeving over it so it's to identify it as an earth cable green and yellow so that's the standard wiring colors at the moment in the UK so you've got your blue which is neutral this bearing in mind this is all single phase colors I'm dealing with I'm not going to go in the three phase it's normally houses people are doing their own work as normally houses so it's mostly single phas so you've got your blue which is your neutral your brown which is your life and you've got your bwire sleeved green and yellow which is your Earth cable and that's pretty much it the old wi colors there's a lot of houses with the old wi colors I'm not sure exactly when it changed but about 10 years ago used to be red and black on Earth was H your red was your life so the brown has replaced the red and your black was your neutral so the blue has replaced the black and your Earth cable was as it is now it was a bar green cable so I hope this helps out if you're looking at your existing wiring in your house thank you"

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"VideoID": "547",

"Title": "Ring Floodlight Camera + Electrical Wiring | DIY",

"URL": "https://www.youtube.com/watch?v=sB8V5hn810U",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] so we got two options in the garage i can go over here it's pretty long run with the wrong conduit under this cross beam or through that hole which is too complicated but we got this one right here for the garage door opener it's a straight shot to the wall just to make a penetration out and mount that box should be pretty simple so we'll go with this route so we'll mount the conduit first in the box extension and run the wires [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] do [Music] [Music] uh [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] [Music] so while we wait for the paint to dry we're going to go ahead and prep this receptacle so we're going to put this black little pigtail on the brass screw actually it's going to plug in so that little hole right there holds it pretty tight the white neutral is going to go on the silver screw and our ground is going to go on this green ground screw so that's prepped ready to go paint's drying i'll give it another 30 minutes to an hour and we'll put this up there splice all the lines together and then we'll install the ring flow that can [Music] [Music] [Music] [Music] [Music] [Music] all right moment of truth we'll see if this all worked out well nothing blew up well looks like it worked out time to open up the app and configure this bad boy and we'll be done [Music] [Music] do [Music] [Music] [Music] hi mama"

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{

"VideoID": "550",

"Title": "how to do electrical wiring in the house and building",

"URL": "https://www.youtube.com/watch?v=0-5x2otPGUE",

"Keyword": "Electrical wiring installation",

"Transcript": "here in this little we have here the simple layout for Pinnacle here is the split pane human air-conditioned convenience and also there is tension box so today we are going to show you how we will execute the wagons or these simple and very common bishops [Music] [Music] and then go to the government and then go straight to the junction [Music] [Music] [Music] [Music] anyway [Music] [Music] this direction we're going in one direction so that it would [Music] [Music] [Music] [Music] this [Music] so original junction box do what I wanted and the way to balance [Music] [Music] [Music] and so this is now our advisor for the convenience of living natural life and the divine and earth quite enough another device this is how it looks like here right now so this is our developer here is the Nutella and the one is the light or the return for our dumb lights this is how it was so we have over [Music] [Music] [Music] nice [Music] [Music] [Music] [Music] [Music] [Music] [Applause] [Music] [Music] okay and this is how it looks when fixing and twisting the wire going to the panel board or the home run cable to 6 mm for the air conditioning unit and [Music] [Music] [Music] [Music] [Music] [Music] now it is already here in the panel board our wire for the split tile PC unit and the supply line for our the drum so it's all here already in the unimportant okay now the wire pudding of this particular Patrol is now complete and it is actually perfectly done junction box and outlets switches and so that's it for the wire pudding for this bedroom"

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{

"VideoID": "551",

"Title": "Installing A Wiring Staple-DIY-Electrical",

"URL": "https://www.youtube.com/watch?v=Jx9gyUzD8N0",

"Keyword": "Electrical wiring installation",

"Transcript": "hey everybody I'm here today with a DIY video on installing wiring Staples this right here is an example of a wiring staple as you can see it's pointy on this side right here and then it has these tabs on both sides to just make sure that you know you know when to stop hammering it in place and this over here is a piece of electrical wiring that I will be using for this video um it's not uh attached to anything it's just some old wiring that I had laying around and I wanted to use it for this demonstration in addition to these two things I'm going to be using a very simple Hammer okay so I'm just going to go around to this side and tell you exactly how to install these wiring Staples so let's say that you have the electrical wire on against the stud and you want to keep it in place that's the purpose of these staples to keep it in place from moving anywhere or shifting or anything like that it's just to hold it in place so you're going to get the staple and you're going to place it around the wire okay I'll do this a little bit lower so that it's on camera a bit more you're going to place it around the wire one end of the staple is going to go on the left side of the wire the other end of the staple is going to go on the right side of the wire very simple don't Pierce It Through the Wire you want to go around the wire on the outside of the wire okay when you get it in place you're just going to hold it in place just like that you're going to take your hammer and you're going to hammer it in place just lightly you just want to get it in place just a little bit okay just enough to hold it in place like that as you you can see the wire can still move freely but the staple is being held in place now you're going to take your hammer and you're going to hammer it down just like that into place just like that now those tabs on the side of the staple will prevent you from over hammering it too far down into the wood but use your judgment if you're using thicker wire and you see that you're pressing down against the wire that's not a good idea hammer it enough so that it's just touching the wire like this so it holds it in place but you know it's not like squishing the wire or anything like that or compromising any of the wires integrity that's basically it it's a very simple process and it's really simple and if you want to hold any wiring in place using a wiring staple just like this I've shown you exactly how to do it in this video and that's all I have for you today thanks for watching"

},

{

"VideoID": "553",

"Title": "AUTO ELECTRICAL WIRING DIAGRAM ( NOT FOR ELECTRONICS )",

"URL": "https://www.youtube.com/watch?v=EQcMWRNXO28",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] [Music] hello what's up so automatic work so welcome back signing salaamu [Music] [Music] [Applause] 7.5 amps 16 at number 18 you number 18 electrical uh 18 16 number 14 [Music] [Music] [Music] foreign oh my god 86 30. power up at [Music] okay so next so [Music] [Music] [Music] [Music] okay works"

},

{

"VideoID": "554",

"Title": "House wiring Tutorial (Tagalog)( NC 2 Electrical Installation) with English subtitle",

"URL": "https://www.youtube.com/watch?v=gWLquD\_xVIE",

"Keyword": "Electrical wiring installation",

"Transcript": " This video is explaining on how to install 1 bulb controlled y 1 location This is the most common connection in most houses Before we start , let us test the materials needed The switch and the wires In testing the material we need to use a multitester First we test is the switch This is the switch In the switch there is two terminal Now let us test switch if it is good condition To test the switch we must set the multitester, to continuity or in the resistance setting Now let us set this to continuity setting If there is connection it will sounds Initial setting of switch is off To test the switch put the test probes to the terminal Initial test is off, so no connection Now if we turn on It will sounds If we turn off no sounds So meaning this switch is good condition So next let us test the wire This is the wire this is the opposite end To test the wire Let us connect the probes in each wire So it is still set to resistance or continuity checker To test if it is short circuit put the test probes in each wire So it must have no reading or no sounds So no sounds it means its safe to use this wire Now let us test the wire if there is any open circuit To test any possible open circuit in the wire connect the test probes on each corresponding ends of the wire Either one of this has connection in this wire It might be this one is the connection or this one, so lets test If no one has connection so there is an open circuit so that was his connection So this wire is not broken Now lets put the test probe on the other wire same process lets test okay overall it is good wire So this one is my second video I got accidentally deleted my first video So if you look its already cut and install all the wires Because i already installed it Lets start to build this 1 bulb controlled by 1 location This is the other materials we need socket outlet junction box circuit breaker Now lets talk how to install wire properly Do not cut the wire Example you measure it then you cut it Never do that Because possibly the wire we cut will be short or excessive Example you cut this Now the wire you cut will not be change The remedy is connect other wire to make it long but it will consume a lot of time So that method is not good The right thing you do is put the wire first inside the juntion bx So the problem is i already cut this Example this one i already cut this on my first video So this wire is not already long But i recommended that before you cut the wire is put it on the junction box So example this wire is long Now install any materials example this one I installed it Install the socket Dont cut the wire yet after you installed it you can now cut the wire So before you installed it you can adjust the wire with this method So that it will be more accurate the wire we used I recommend you to do that after you install put some staple on both ends Now lets install the switch Now we finished to install Now we will do the wiring Now we have two wire, this is our main source So example this connection is line to ground, this is the hot wire and this the ground There are two kind of connections line to line and line to ground The line to ground has hot wire and ground The hot wire carry a 220 volts The ground has no power In line to line both of wire carry same power It has 110 volts each wire So its the same power Now i will explain is the line to ground Because the line to ground is specified that hot wire is for switch Thats why its better to explain compare to line to line Because line to line can assign any wire for switch for the reason it has the same power in the diagram the ground is directly connected in the bulb or load Now we finished to connect the ground directly to bulb Now the hot wire is connected in any wire in the switch So this one i choose for switch The other wire of switch is connected to the bulb The outlet is directly connected in the power source No polarity so any wire connect in the source But be careful not to short the two wires the ground and the hot wire The outlet directly connected in the main power So lets put electrical tapes In electrical the most difficult is the installation Not the wiring is the most difficult Before we test it , let us check the connection If it is short circuit or it has open circuit In testing short circuit, the main source is must be parallel the line and the ground To check it set first the multitester in resistance No reading mean no short circuit which is good So the bulb directly connected in the ground Turn on the switch there is connection Now in the outlet So our connection is safe Let us Light up the bulb Lets turn on the breaker So its light up and off So this mean our connection is good Now this connection is 2 bulb controlled by 1 location First we do is directly connect the bulb in the ground So every load added it must be directly connect to the ground The other wire for the switch Dont put the wire directly connect in the main source If we put the second wire directly to the hot wire it will always turn on the bulb Lets connect the second wire in the switch where the other bulb also connected switch on Now let us test the outlet To test the outlet If there is power we must set the tester in the AC voltage to the highest setting Now we test the outlet No polarity It has reading Here also it has reading The outlet is working So thats all Pls subscribe for more videos"

},

{

"VideoID": "555",

"Title": "Wiring an electrical socket #shorts #setup",

"URL": "https://www.youtube.com/watch?v=HC2LPGocvFE",

"Keyword": "Electrical wiring installation",

"Transcript": "Let's Get Down Let's Get Down business [Music] [Music] no said before I don't mean it it's been a while since I had your attention in my heart"

},

{

"VideoID": "560",

"Title": "Underground Cable Locators - How To Pull Electrical Wiring #electrician #electrical #electricity",

"URL": "https://www.youtube.com/watch?v=k04gyZKyB-4",

"Keyword": "Electrical wiring installation",

"Transcript": "so we have our underground cable locator and \nwe're trying to figure out where this empty   conduit goes so what we do is we take a metal \nfish tape now you need to be careful with this   because if you have any electrical equipment you \nmake you want to make sure that you don't send   the fish tape up inside of it so we only \ngo about 5 ft at a time so we shove this   in the conduit just a little bit and then we \ntake our transmitter and we clip it onto the   fish tape and right there is our conduit if you \ncan hear that and then we take our transmitter   back off we go another 5 ft and there it is and \nthere it is again and there it is we found it"

},

{

"VideoID": "570",

"Title": "ELECTRICAL Service PANEL INSTALLATION, WIRING for PHASE CONVERTER part 2",

"URL": "https://www.youtube.com/watch?v=PMAC3wSMBBM",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] hey guys we're we're back here behind the shop today it's actually two days since we finished this panel yesterday I just did a little condo at work and and some other ketchup things I needed to do you probably weren't gonna see most of that on camera anyway if you want to see guy bend conduit shayden hkw has a youtube channel stan Zukowski stan as the master at bending conduit he has some youtube videos on how to do it i'm not going to go into it because i'm certainly not an expert I can bend my own conduit but it takes a lot of head-scratching to make it look right i encourage you to go to Stan's channel and check it out what I did do is I wanted to raise this conduit up here up high this whole area back here behind the shop is not just used for the shop I use it for the shop my kids also use it to wash their hands they wash chicken eggs and we wash produce back here anything that comes from the farm so this is a multi-use area so I ran it up high when I ran it up high the wires are no longer long enough to make it all the way into the box so I needed a place to make a junction that's this box right here now my favorite way to do it to put a put connections in the middle of a wire but you know it is what it is also remounted the old switch box here these wires pass straight through this box they come into the breaker panel speaking of the panel let me show it to you now this panel is hot right at this moment let me explain to you why I made it hot I have one breaker and one connection made for that refrigerator down there a couple days of transpired since we put this up I didn't want an extension cord out here running the refrigerator although I'm not above that it just it wasn't much to wire up this one circuit so it is hot right now and all of this wire that's in here will pull all of this out I'll explain to you what this stuff is this wire right here they go down for the oven down at the end of the shop and some lighting needs here all of this is the conduit that comes in at the bottom of the panel that feeds the air compressor over here as a matter of fact I didn't have to add any wire all the wires are long enough I just had to cut my conduit a little bit shorter and put a box offset down here to get into the box alright so here's how this panel works this is the main breaker when this breaker turns off it shuts these two strips down the middle with all these fingers on it these are our bus bars for the power each one of these bus bars has 110 volts if you measure with a power meter now let's talk about breakers for a minute it is a common misconception that breakers are there to protect your appliance for instance your stove your television your computer everybody thinks that breakers put there to protect it that's not true breakers their only purpose is to protect the wire in the wall or the wire that's feeding that circuit wire is rated and what it's ampacity is think of current like water flowing through a hose the bigger the hose the more water that flows through it current is just like the amount of volume of water as that current begins to flow through a wire as that current increases heat increases so wire is rated to where it can safely carry current without creating heat once it reaches a point where it starts to create heat the breaker trips breakers their only purpose is to protect the wire for what the wire can handle so this is a number 12 wire number 12 wire is rated for 20 amps so I have a 20 amp breaker we have two styles of breakers this panel is a GE panel it's made by General Electric many different companies that make panels GE Siemens Square D in the United States they're all very common panels these breakers fit a GE panel you've got to know what kind of panel you have to make sure you put the right kind of breakers in it these are either single wide or double wide double wide because when we plug this breaker in we will pick up one lag on one side and one light on the other distributing the load evenly and giving us 240 volts the wire comes out of the back of the breaker just like you see here there's a screw connection here tighten the screw connection down on the wire and it delivers power downstream to our load whatever our load is in this case it's a refrigerator and a water fountain for the my kids these particular style they hook in the back and then they just go in and push in and stab and to make the connection then we can put our wires in place back here I'll turn the breaker on and the circuit becomes live the single-phase breakers same thing only different they only go on to one of these little electrical tabs here you don't want to put all of your 110 breakers on one side of the panel because you'll be drawing the load somewhat evenly so you want to try to kind of think about it and stagger out your loads so you're drawing off both legs somewhat evenly I want to give you a real quick look inside this rotary phase converter let me stop by saying this much I'm really really really impressed with the way this rotary phase converter is put together and you know a lot of times it's the little things the attention to detail that really stand out and I let me give you just a real simple for instance if you've ever knocked one of these slugs out of a knockout you know sometimes you got to get on them with a hammer and a screwdriver hammer and a punch to get these knockouts out but I think these knockouts are laser-cut and literally it was just one swift tap with a hammer and it came right out another thing the cases are very heavy gauge they're not flimsy like you know the box store power panels and stuff are it's very very heavy duty the door thought has been put into the door this door just slips right on and off this door has all of the controls to start and stop it but let's say you're working on it and the door is in your way well you can open the door and then take the door off move it to the side so it gives you full access right inside this panel to do your work now you'll see a bank of capacitors in here this capacitors are to help start that the idler motor and what we have here is my power that I've run I've already pulled in here so we have our red our blue and our black and then we have the two power leads that are gonna supply power from the hundred amp breaker up there then I have a ground wire that came in through another conduit and then this is just a piece of like thermostat wire this will be our signal wire that inside when we finish terminating we'll be able to start this rotary phase converter sitting out here from a switch on the wall I've had some time to button this panel up everything is done its terminated and we're ready to close this panel up here's what I've done there's two pieces of seal tight that go into the bottom of the box seal tight is just a flexible kind of vinyl conduit that allows this machine to be able to be moved around and still keep the wires and conduit through this piece of half-inch seal tight here I just have a piece of number six grounding wire comes over and ties to my safety ground bus here the other conductors that come from this breaker here into the Machine and then from this machine to the three-phase panel inside those are in they're terminated on the inside they're just not terminated in this machine this box came from the factory with a bonding bar that bonded the safety ground to the neutral because they eventually have the same potential and I remove that bonding bar so now the safety ground and the neutral are not tied together until they come into this box right here also I added a bonding screw which ties the safety ground to this metal can which makes this a safe or neutral potential at all times all the wires were all terminated out everything's done I have a couple of extra connections for here I even have my little stickers here so when I put the cover on it I can label everything appropriately where it goes I've just been kind of ringing that out so we're back inside the shop we're gonna put the new three face panel right here you can see where we drilled the hole from the outside to the inside it busted through here I think I got the drill just a little huapi jaw there it was kind of a weird angle I was drilling that which is perfectly fine because we've got to wind up breaking the whole lot about that big so we're just gonna wind up breaking it out in this area unfortunately we're gonna have to lose the signage that I have here at least these two for now I kind of bummed about that but we've definitely really liked this sign so we'll find another place to put it or we'll move some other stuff around one thing I'm gonna have to do is I'm gonna have to pull this piece of conduit loose when I pull it loose I'll have to pull it from the junction box there I'll lose all the circuits on this wall that's okay we're gonna reconnect that into the three-phase panel it'll come through the three-phase panel it does look like a bit of a mess here and it is a mess let me explain a little bit it's the way it is I like to when I do boxes any kind of electrical box I like the wires to be all laid out neat a lot like stands and Kowski does his boxes however when I'm laying this this setup out not real sure how everything was gonna terminate so every wire has enough in here that I if I need to move this breaker to this side that I can bring it over here and still have enough wire to do it makes it look a little bird nestea although you know it does lay out a little bit neater here in the end this plus the extra circuits that I have in here makes it look a lot worse than it actually is I know I may get some comments on this let me explain a little bit what's going on here so we got two hot legs these are number six wire going to the welder outlet they came off a 60 amp breaker there's a black wire that looks white and I use that for my neutral for the welder outlet and let me explain why I use the black wire instead of a white wire green wire white wire didn't have any of it but I had a whole spool I think I know a thousand foot spool of this black wire so what I did is I wrapped the whole tape with phase tape now people will freak out that aren't electricians and you know they don't understand and it's got to be a white wire for the neutral no as long as it's phased on both ends that you know that it's clearly marked that it's the white neutral doesn't matter what color the insulation ISM is underneath the same here this is my safety ground it's a blue wire but every so many inches I have green tape from here to here and then I have green tape here and another piece of green tape back in there so it's clearly marked here and I'm sure it is on that end because I did it but it is the safety ground for this this setup so what we've done here is made the hole bigger the hole is made bigger so that the EMT conduit or plastic conduit whatever I put between the wall here has plenty of room to pass through and we got a little bit of wiggle room for lineup the next thing I want to do I've got a level up here on top of the box I want to line these two up so they're perfectly level and then mark the hole locations mark at least one hole location I think the rest of them I'm gonna actually drill in place all right so I've shortened this piece of conduit that goes from here downrange just a little bit the width of the box we're gonna put the wire back inside and make our connections back again so here's something really nice that worked out that proves the point I was making earlier this this power cord needs to come down go over and come through this box into the inside here this box really doesn't have anything to do with this box other than the fact that our conduit or our wire has to pass through but remember before I said I always like to leave enough extra wire so that I can go all the way to the other side of the panel if I ever need to swap breakers well because I did that I actually have enough wire to come down come up come over and come into all the breakers I think I can reach all the breakers on this side as well as my neutral my safety ground and the 110 circuits that all go down this side so I was afraid I was gonna have to do a splice here in the box which I don't like this place wire but it looks like I'm not gonna have to do any splicing no it looks like it's all gonna fit nicely so that's kind of my next step is to get power restored back to this back wall of the shop so we're gonna run the wire through there and then we'll start looking at figuring out where all our circuits are gonna go so that's gonna work out real nice I know this drives up some OCD people nuts especially people that like to heat their panels super super neat which I totally appreciate and my OCD does tug at me a little bit with this however it's times like this that I've learned over time of always being short with wire and it worked out wonderful because I didn't have to make any extension there is no other wires that are going to come in or out of this panel and through this panel just these right here all the wires will come from out back into here to feed the main the three lugs for the three-phase and then out of the breakers they'll go up through the conduits and out to the other services here in the shop as we need to add more so here's what we got done we got the panel mounted the conduit comes in to the panel the wire is all through there and it all just ends right here in this panel I put the cover on the panel just to mainly keep dust off because you look there's no breakers in the panel yet I'm still sourcing some breakers the conduit and the wire have been pulled throughout the shop and almost all of the terminations have been done one more thing that I did off-camera if you look over here at this panel right here are these switches right here on the wall well that used to be a double plug on the bottom and a double switch up top what I've done is I've added a few circuits for a couple of reasons those two switches up top now control my two air compressors behind the shop so I no longer have to walk around outside the shop to turn the air compressor on if it's a rainy day crappy day nighttime cold whatever I can now turn either air compressor on from right here in the shop now this switch right here is how I'm going to turn the rotary phase converter on and if you look right here at the top of this box it's gonna go right here once we're done ringing out all the wiring that'll be a start run stop switch for the rotary phase converter so all my controls here from the shop are cut in one nice little central location I don't have to walk to different sides of the shop off camera I went ahead and pulled some wire through the wall to the art from the RPC end of this panel I ran a number 4 conductor wire now number 4 is good for around 100 amps and honestly we're not gonna be anywhere near that will probably be likely be about 80 amps maxed out on that machine out there output but I went ahead and ran the number 4 just in case I ever do future expansion I don't have to run new wire these wires are phased appropriately following the black the red and the blue the blue is the manufactured leg inside the machine I also went ahead and ran a neutral we won't be using a neutral at all in any of our applications so far but in case any future applications need that neutral to run something like a contactor I went ahead and just ran a neutral the safety ground also ties to the rotary phase converter and into the panel outside so everything is tied together alright well they say things don't always go as you have planned and that would be the case here my plan originally when Chris people from American rotary came by the shop was to film us terminating the wires in this panel and and show you the last step in this but we honestly Chris came here behind the shop he went yep that's right yep that's right we spent about maybe 5 minutes back here checking a couple things out tighten up a few connections and closing the panel up and honestly we were done we had a great time that day we did a couple of live feeds one of them is on the Dewar a fabrication YouTube channel there's also a live feed on the do-right fabrication Facebook page and one on the American rotary Facebook page and truth be told one of the reasons we might not have had as much time before it got dark as we expected is there might have been a Nerf dart gun war between Chris Fievel and a couple of guys here on the farm Chris Fievel he took a shellacking so Chris people when you're ready to come back and want ask for a rematch just let the Masters of the dart gun war know the a rotary face converter is hooked up it's all operational as you can hear it it's super quiet matter of fact inside the shop you cannot even hear that it runs so I'm really excited of having this american-made product powering my shop I'm really excited about American rotary giving me this opportunity to have this piece of equipment for my shop be sure to follow us on the deer a fabrication Facebook page on Instagram and we'll see you real soon thanks for watching I hope you enjoyed what you saw here today be sure to subscribe to my channel and like us on Facebook please somewhere down below here is a link we've got a lot more really cool stuff coming is that right camera guy is there a link down there send me a comment I'll try to get back to you as soon as I can click whatever link click something see you soon"

},

{

"VideoID": "574",

"Title": "Fuseboard Overhaul: Transforming Your Electrical Safety!",

"URL": "https://www.youtube.com/watch?v=HC3k7pdJ9KM",

"Keyword": "Electrical wiring installation",

"Transcript": "right so today we have the pleasure of upgrading this and finding out what the hell that is when changing the board you can't get any more convenient than that perfect would it be a bonus if these just sat on that dim rail cuz then we could just fill it it's a metal board and we could basically fill it with new rcbos uh yeah you probably have to put a neutral bar in and stuff like that let's change the whole board right we got the board in in that Earth is too short we're going to have to nip off and get some more of that but for now let's get these rcbos in pop down to the Local H Sailer make sure they have 3 m taals cut ready for me find them at first bed you're a legend I even hung around for the guys to come back and put their tags on the meters yeah I know nice a i"

},

{

"VideoID": "575",

"Title": "PAANO MAG LAYOUT NG ELECTRICAL WIRING SA KISAMI AT MAG INSTALL NG COVELIGHT AT PINLIGHT?? |Part2",

"URL": "https://www.youtube.com/watch?v=gwOxU1hooeg",

"Keyword": "Electrical wiring installation",

"Transcript": "[Music] hi guys is [Music] foreign [Music] [Music] hmm guys foreign [Applause] [Music] foreign foreign [Music] [Music] foreign [Music] okay foreign foreign foreign [Music] foreign [Music] [Music] um [Music] [Music] [Music] [Music] [Music] foreign [Music] right [Music] foreign [Music] [Music] repair m [Music] um [Music] [Music] so when [Music] [Music] [Music] [Music] close [Music] [Music] [Music] foreign [Music] now [Music] then so yeah [Music] [Music] [Music] foreign [Music] [Music] foreign [Music] [Music] then [Music] [Music] foreign [Music] um [Music] [Music] a [Music] [Music] foreign [Music] [Music] [Music] [Music] foreign [Music] [Music] [Music] foreign [Music] foreign [Music] [Music] [Music] one two three so foreign and see you in my next vlog thank you"

},

{

"VideoID": "583",

"Title": "Taping wires to a fish pole #diy #electrical #repair #wiring",

"URL": "https://www.youtube.com/watch?v=HnwIHrruEf4",

"Keyword": "Electrical wiring installation",

"Transcript": "you guys saw that there was no bushing in there so what you need to do is strip these wires out like this clip the ends and then we can actually take these grounds and wrapping it around there will make it so that this wire cannot pull off of there I've got the head all done it's nice and smooth there nothing Jagged sticking out I know you guys saw that there was no bushing in there so we'll use this black button and we install it upside down but to get it around the wires we just clip this off and then it looks something like that you will blank this off as well since we're here"

},

{

"VideoID": "602",

"Title": "House Electrical Wiring Plan, Symbols, Diagram and Complete Layout | AKR Technical Malayalam",

"URL": "https://www.youtube.com/watch?v=vQvx4L7r68k",

"Keyword": "Electrical wiring installation",

"Transcript": "foreign foreign foreign but description foreign ceiling foreign foreign foreign [Music] thanks for watching [Music]"

},

{

"VideoID": "616",

"Title": "(+256 760081640) Experienced Electrical installation in Kampala Uganda",

"URL": "https://www.youtube.com/watch?v=Pss3C2Ii9NM",

"Keyword": "Electrical wiring installation",

"Transcript": "power outages are already solved call eron's electrical services to install a high performance solar system for your home and Business have you been wondering where you can find the leading company in electrical installation in UGA aon's electrical services is here to help please call us on 07864 31 power outages are already solved core eron Electrical Services to install a high performance solar system for your home and Business have you been wondering where you can find the leading company in electrical installation in Uganda aon's electrical services is here to help please call us on 0708 6431 power outages are already solved call eron's electrical services to install a high performance solar system for your home and Business have you been wondering where you can find the leading company in electrical installation in Uganda aon's electrical services is here to help please call us on 0708 6431 have you been wondering where you can find the leading company in electrical installation in Uganda aon's electrical services is here to help please call us on 0708 6431"

},

{

"VideoID": "633",

"Title": "Haynes Electric Construction - Industrial, Commercial &amp; Residential Electricians in Asheville, NC",

"URL": "https://www.youtube.com/watch?v=MeK6B-XMHMY",

"Keyword": "Commercial electrical construction",

"Transcript": "when you have a problem at your home or business call a company you can trust at Hanes electric every job is backed by our team of professionals as part of the mban corporation we bring the same expertise to every commercial residential or institutional job whether we have a renovation project scheduled or an emergency we can always count on Hanes electric to take great care of our hotels our guests are counting on us and we count on hes electric hannes is on your team"

},

{

"VideoID": "634",

"Title": "Commercial Electrical Construction Jobs - How to",

"URL": "https://www.youtube.com/watch?v=\_dTB-YJnUdE",

"Keyword": "Commercial electrical construction",

"Transcript": "hey 360 electricians little teaser video in the next couple of days i'm going to put out a video on our starbucks project i want to talk about switchgear how we ordered it how we get it ordered how we put it in etc etc let's go through this wall right here where our panel ended up moving over there and go into the actual electrical room and i'm just going to talk tomorrow about how these panels come how we install them and how we do it according to the plans until then comment below and tell me how much you think this 1200 amp square d three phase switch gear cost us we will see you in a couple days"

},

{

"VideoID": "637",

"Title": "Commercial Electrical Final Job Walk - #commercialelectrician #electricalcontractor #shorts",

"URL": "https://www.youtube.com/watch?v=QfLZKximaVE",

"Keyword": "Commercial electrical construction",

"Transcript": "all right it's good to be back at one of our projects if you remember this ground up shell for Popeyes we did down here the building is now completely finished I got the opportunity to come down I'm meeting uh Spectrum internet and they are gonna put some wires down customer asked me to come down here so just wanted to show you a finished product and a couple of things that we did on this job so first things first we did install all of the light fixtures themselves we did all the lighting on the building itself as well as you can see we did run power for all of the boxes that they have here we are not responsible for the connection but we did run some of the boxes you can see we did run power to their sign and if you remember our service panel was in here turned out pretty nice ground up shells pretty cool job hopefully you guys will get something like this in your area once you hook up with a good contractor and you do a good job you'll keep getting"

},

{

"VideoID": "638",

"Title": "Making and Extra 3k on Our Commercial Electrical Job - #electricalcontractor #electrician",

"URL": "https://www.youtube.com/watch?v=0xJOw24unbs",

"Keyword": "Commercial electrical construction",

"Transcript": "our clients a big developer and he's going to have multiple jobs so right now they're renting that poll from the fence company you know Nationwide and all these different companies he asked me for us to put our own poll there so he doesn't have to pay the rental fees because this is going to be a one-year project plus he'll have that Poll for the next project he's a very conscious cost-effective kind of guy and we're going to take care of him"

},

{

"VideoID": "639",

"Title": "Commercial Electrical ⚡️#construction #electrical #grounding",

"URL": "https://www.youtube.com/watch?v=Mg3MDjOxVgs",

"Keyword": "Commercial electrical construction",

"Transcript": "on your Triad you know you lay it out in a triangle like so and it'll come out from there and go to the Transformer or to the distribution panel CT cabinet whatever is first in line check out the full video down below have a great day thank you"

},

{

"VideoID": "640",

"Title": "Changing light bulbs/ lamps in a commercial store 🏬 #electricalwork #electrical #construction #spar",

"URL": "https://www.youtube.com/watch?v=l0FjVNSd9dc",

"Keyword": "Commercial electrical construction",

"Transcript": "so here we are today we're going to be replacing all these lights here uh adjust the bulbs a lot of these only have one working light here uh some are not working at all so we're going to replace all these light fixtures today"

},

{

"VideoID": "643",

"Title": "How to be an electrical contractor - Start your contracting business the right way",

"URL": "https://www.youtube.com/watch?v=YEOtljlWS0c",

"Keyword": "Commercial electrical construction",

"Transcript": "oh my gosh is it finally time is it here are we doing it have you finally decided that you're going to go on your own you're going to start your own electrical company that is one of the best decisions you probably ever made in your life and i know it's going to be one of the scariest so in this video i'm going to give you three tips before you even start what you need to do to make sure you are way ahead of the competition i'm going to give you some advice that probably will save you a couple of years of marketing time stay tuned hit the like button hit the subscribe button let's get into the video all right 360 electricians before you even try to go and get your contractor's license i don't care if you're in business i don't care if you're a dry cleaner i don't care if you're hvac or plumbing before you go and get your business license these are the three tips before you start your electrical contracting company that i want you to hear something that i did and it helped me quite a bit it's it's marketing not everybody knows marketing you know electric but you don't know marketing uh i didn't know marketing i learned it along the way this is my third business so this is something that i did in the very beginning and it helped me immensely okay so number one is when you pick your company name try not to pick your personal name two reasons for that number one if you ever grow and get huge or bigger everyone's still gonna call and ask for you by name john smith electric john smith's gotta be the owner they're gonna keep asking for you john john john john john when you get bigger when you have two crews three crews four crews you're not gonna be able to answer the phone you need that phone to go to the office you need someone that doesn't really know electrical very well uh as a secretary or an assistant or somebody to just answer the phone and say well i'm not an electrician but i can get an electrician out there we charge a certain amount of service call you do the process you get a name and you you leave it very generic you leave it you leave yourself room so you're not dealing with all the problems issues scheduling et cetera et cetera okay us as contractors sometimes we don't meet our appointments it's easier for the shop to call them and say you know i apologize our technicians got caught up we're not going to be able to make it obviously you're not lying it's true you're busy but if you're on the phone john come on john i need you to come out dude come on man you promise you're going to come out you don't want to deal with that stuff try not to use your name the second thing is uh if you ever sell you're going to sell easier when the name's not attached to you okay when you grow and you want to get expand sell get out of the business whatever you want to do the name's not attached to you okay you can also put the corporation name under the generic name you don't want to necessarily put your corporation name under john smith electric inc right you want to leave a generic one third thing is trolls people that don't like you bad reviews anything you don't want to tie you know things happen in life you know accidents happen in life you don't want to tie that to your name when you incorporate in a different name and something god forbid happens you can walk away you're done you can legally separate you separate by not everybody knowing oh john smith oh i know that guy that guy was on youtube blah blah blah this is what he did you know anything things happen separate your name okay i should say there's one other reason when you pick a name and you stick with it and by the way i recommend you write as many names as possible that you like i remember when i started you know i tried alpha electric i tried west coast electric i tried um oh gosh i tried so many of them but i want you to just pick a name that's generic i want you to pick four or five of them why because tip number two and three once you're set on five or six names try not to get your heart set on just one and this is why the next thing you want to do and i think it's super duper important is you want to make sure that there is a dot-com website that can attach to that name ah i didn't think about that right you can do some squirrely.coms don't get me wrong if you ended up being you know uh northwest uh underground overhead electric whatever yeah you're probably going to get that website right no one has northwest undergroundelectric.com duh but if you want to keep it short and simple and you want to keep it short and simple it becomes a little harder to get a com that's going to match it so alpha electric ain't going to work alphalectric.com is taken so you want to kind of get away from that name if you can now you could also make it like alpha electric and the city you're in com and you can still keep the name alpha electric but what you want to do is you want to get a combination of name that you know has a very good.com uh url attached to it okay so if you can do that you're already ahead of the game i would say you're okay to go ahead and get that name on your application as you know whatever electric you're going to be but here's the third one that kind of helps and if you can do this and this one it makes it really difficult so let's just say your west coast electric again i'm just throwing it out there you want to try to get a phone number that matches that now i'm all for toll-free numbers and this is the reason why when you get a toll-free number if you're in a tri-city area where you're going to be covering a lot of area codes having a toll-free number is your main number is a good way to go because you only have to advertise one number remember 10 years from now people are still going to be calling that phone number so you want to make sure that that phone number can somehow tie into your name which also ties into your url and what do i mean by the phone number tying into your name so on phones every single phone on number two is abc three is def right and so on and so on until z so what you want to do is if you're west coast electric maybe you want to get a phone number like a toll-free number that says 877 and then 2 for example is e so you would do you know like or w whichever number that is i got my phone here i can look but anyway maybe you could put w c e l e c by dialling the numbers does that make sense for example ours is 742-5360. you know what 742 spells pick p-i-c-k and guess what last three or 360. so our toll-free number is blah blah blah p-i-c-k 360. how easy is that when you put that on the side of your van you know your toll-free number you know you got your alpha electric or west coast electric and your toll-free number is 877 uh wc electric if you spell it out then you can put it up there then you can put the le the numbers underneath it so that's your triple threat try to get a name that you can definitely hook up a website to try to stay away from anything but dot com it is the most popular if you absolutely can't that's okay no one's just going to type your name and com they're always going to search it somewhere and if they search it it's most likely it'll come up but you and i know comms are the most important name your.com and if you can a toll-free number even a local number that somehow spells out or says something about your business you're on your way to some serious good [Music] marketing i hope you've liked this video if you got any value out of it please hit the like button and most of all subscribe we'll see you on the next one"

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"VideoID": "644",

"Title": "Commercial Electrical Work- Check out the new build in 2023 #Electrician #Contractor",

"URL": "https://www.youtube.com/watch?v=\_cEBfAfBYOY",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] bam West Hollywood our big commercial project hey are you doing commercial I keep talking to you about it got a video on this project I'll post it up above we'll see you on the next one"

},

{

"VideoID": "646",

"Title": "Electrical Service Business vs Electrical Construction: Why I switched to residential service.",

"URL": "https://www.youtube.com/watch?v=4PrP\_PS9y9E",

"Keyword": "Commercial electrical construction",

"Transcript": "what's good terry electrician here and i'm out here in these streets putting in their work on my way to a service call or actually finishing up a little job um i installed a couple ceiling fans and now i'm putting in an overhead light in like the living room where there is no lights so i'm running cutting i like cutting sheetrock on that note i just wanted to uh briefly kind of talk a little bit about you know construction versus service you know originally when i started my electrical business back in 1999 i was a full-service electrical contracting service which means i was doing and it was commercial industrial no residential which means i did uh you know full scale electrical construction you know commercial build outs anything from commercial renovation to you know new construction commercials you know light commercials that type of thing the industrial side was basically um you know like control panels controller because that's what i that's what i specialize in in the military was uh motor and systems controls uh said i'd like to say this today my business is solely focused on residential electrical service and installation okay which means any type of electrical repairs that's needed in a home i do installations any type of electrical installations that is required in a home i do for instance um custom lighting smart home devices you know your marine cameras your your google cameras or whatever your nest thermostats um and even uh appliance repair i even do some appliance repair and installation i do i install garbage disposals i installed dishwashers uh i installed wall ovens because you know if it has an electrical connection to it i made it my business to learn how to do that to install it uh service and repair i also do you know like repair for dryers and washing machines and a little bit not not too deep into that but i do some of that um dryer vent cleaning things like that so on the service side uh like i said when i started my business in 1999 it was fully commercial or like i said what we call light commercial construction we did restaurants um i did my first my first contract was like with the va uh hospital where they you know they was constantly doing expansion at the va hospital here in atlanta and i was able to get a small contract for a section where i was actually replacing some smoke detectors in a hallway and it was a decent sized contract because it's all government you know government job and prevailing wage and all this kind of stuff and um that was my first you know contract uh once after i started my business second uh i had another kind of another little deal with the va where i installed some lightning arresters on the top of the building one of the one of the newer buildings uh during the expansion where they didn't they needed lightning arrestors uh uh installed and i did that around the top of that building today like i said i'm i'm not doing any commercial anymore you know eventually i moved in a little bit i moved into commercial service because i i hooked up with a a commercial property management company where we did a lot of i did a lot of build out and service for these people i did that all the way up until last year back in the early 2000s doing the housing boom a real estate boom here in georgia man we did 90 of what we did was uh residential renovation you know the fixing flips until until the bubble bust and uh basically about put me out of business so again said all that say this you know renovations and stuff like that and build out that's that's what i call that's what i consider construction no longer in the construction business service and installation and residential only i'm i still get calls for commercial service i still get call for commercial construction i turn them down because i don't i don't i don't i don't do it and i don't want anything to do with it anymore uh the money here's the thing money wise yeah the check the the the jobs the contracts and the checks are bigger but so is the logistics the management uh the material and labor cost everything is is more so it's all relative you know you got a lot of people out there to tell you oh man you know you should be doing commercial been there done that been there done that you know what i mean um we got very good at doing uh salons uh like i said this one for uh commercial property uh company we work for has a lot of uh you know he had a lot of commercial properties strip malls and stuff like this and uh we would do the what's called a white box for this for these spaces and people will come in and lease the spaces well if they didn't have a contractor to do their build out we would turn around and do the build out so yeah we were double dipping which is nothing wrong with that but because we knew the property so well they would they would we would get first dibs we didn't always get them but in that network there's a lot of salon owners they're building a lot of salons and uh where they do like the eyebrows and and and stuff like that and the waxings and we did a lot of those we did a lot of those man four or five years ago and uh like i said yeah the but the thing the thing is the the margins yeah like i said the contracts will be bigger or whatever not always but the profit margins were just ridiculously fit i mean uh i made a living i didn't make much i didn't make any profits i didn't make any profits just be 100 honestly so i came to the conclusion in at the end of 2019 that i was going to shift my business model from from all of that to strictly focus on residential service and installation and it was the best thing i could have done man it was the best decision i made since i started my business um hands down hands down the the number one best decision i made because everything is different man i mean like i said the money uh my my target market uh i deal with a lot of uh more affluent homeowners okay so today i don't get a whole lot of price objections you know back when i was doing those especially when i was doing those fixing flips man they beat me down to the to the core on the numbers you know it is always the the cheapest bid you know the cheapest the cheaper the cheaper they can get it you know what i mean so they can make all the profits i understand you got you running a business uh so you know you're in business to make money um but they seem to not realize that you know i'm in business to make money as well you know it ain't just about you making all the money i'm trying to make money too now ask me if they gave two shits about that of course not you know but at the end of the day the best decision i made business-wise was to change my business model from construction especially commercial to service from a construction-based business model to a service-based business model there are many other reasons why a service-based business model in my opinion is far superior to a construction-based business model uh i may get into that more into that in in later videos but for now that's all i got for you uh stay tuned and you know check out the next video because i'm gonna have some more good stuff for you that being said you may or may not know what's coming next but here you go deuces"

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"VideoID": "648",

"Title": "Beyond The Crete - Creating Automation in Commercial Electrical Construction",

"URL": "https://www.youtube.com/watch?v=R5sP-gN0UWU",

"Keyword": "Commercial electrical construction",

"Transcript": "what's going on everybody we have a really special episode on this one Dylan Mitchell electrical engineer has over 750 million dollars of project management and building electrical expertise under his belt so we're going to learn about um how commercial construction works and electrical and panels and safety so stay tuned don't want to miss this one if you're in any type of commercial environment [Music] hey what's going on everybody Welcome to Beyond The Creep we have another amazing episode today we have Dylan Mitchell so I'm going to do a quick bio about Dylan and then I'm going to give him his two minutes to kind of talk about himself so Dylan Mitchell is a professional electrical engineer that has 750 million yep I said that correctly 750 million dollars worth of construction experience centers belt from projects that range from restaurants and TI's to new construction buildings of K-12 so Elementary and higher education buildings industrial manufacturing Healthcare Hospital practices so Dylan's Mission and that of his company Cowabunga Studios is to help provide engineers and contractors an easy path to construction documents his experience designing and managing large projects gave Dylan expertise to help navigate products and provide drawings and Bim models quickly to help keep your projects going so with that that being said what kind of two-minute story can you elaborate on been so in doing all those projects right over um my years of being in engineering and I went from doing safety stuff to in an architecture and engineering firm and really about um how it's coming up on well it's a little over five years now I ended up getting shingles putting a hospital project out the door so I had a 30 operating room renovation and I got shingles like right as I put design documents out the door um and as I was going on vacation like two days before getting on a plane I got shingles so my entire uh Hawaiian vacation was spent uh in pain and if nobody's ever had shingles I had it on my chest and on my back so it's hemispheric also is on my left side basically wrapped fully and I'm a side sleeper so I couldn't sleep it was painful for the whole you know 10 days or whatever that I had it you know no drinks in paradise and so that really solidified my my mission my purpose to help Engineers to really not have to go through this right you look around the industry uh in construction in general right there's high stress you know half the people are on high blood pressure meds they've got you know they're overweight they're uh stressed out right I've seen people have strokes um all the medications people on I've had another guy that had shingles here recently like you know the tumors that I've seen in guys that are like 30 right I was like 20 uh six at the time so I mean again like that shouldn't happen to a guy his 20s like marathons all that kind of stuff and um you know have this happen so really that that solidifies the mission and and why I'm doing what I do in Cowboy Studios and it really helping engineering firms it's like the drawings out the door faster you know whether that's kind of a design assist and we help you to design it lay it out get it done quickly for you or taking it fully through construction documents right on cool now I'm gonna elaborate more on that in the late in the last bit of that but let's get to the Past okay so it's been about 15 minutes or so talking about your past or I mean not childhood per se but like when do you get in the construction industry and like how did you get started what were you doing how could you get from entry level day one to start literally working as an engineer working on 750 million dollars worth of projects yeah and I mean really in getting to like that scale of construction um I mean I I skipped a couple levels but really for me to get into construction and that whole thing it really started for me in high school uh we moved to Oregon I lived in Northern Virginia um and kind of after 9 11 and the DC sniper you know I was in Middle School my parents you know moved us across the country to where my grandparents are on the Oregon coast and we ended up living off the grid so we have cattle and all that kind of stuff we just couldn't find land um kind of in the on the coast in Oregon so we ended up getting 40 acres up in the mountains a little bit and my neighbor ended up being an electrical engineer from Lawrence Livermore National Labs worked on laser programs and like you know the Reagan Star Wars and a bunch of other you know super secret stuff uh but that really opened my eyes you know and living off the grid right we had wind solar Hydro generator right we had all the stuff living off the grid and then I had a neighbor who was a electrical engineer right and so that really pulled me on the path to becoming an electrical engineer and going to college for it I went to Rose Holman uh they're in the midwest in Terre Haute Indiana and it really solidified like I thought you know maybe I'd go work for utilities and I I interviewed a few of them you know Duke Energy being the big one there in the Midwest and it just that didn't end up happening right I went up for wound up working for a company that did arc flash studies it was a rose grad that came back and so arc flash for I know this concrete podcast but it's uh we do so Arc flashes basically anytime that you open up a panel electrical panel and you you know take the covers off you're working on it what is the incident energy level that you're exposed to right so this is all in calories per centimeter squared but basically what's the blast if you were to base uh take a crowbar and stick it across all three phases what's the power and uh blast that would come out at you right this is hotter than the sun it's molten metal and copper that would come out there's a sound wave Associated to it so you know you got to wear earplugs and then all the PPE that goes with that so we would determine basically what level of PPE that you would need to protect yourself from that blast you know so that the worst case is basically a sunburn not you're going to the burn unit and I did that for five years you know opening up gear and panels and being in industrial facilities with electricians and all that kind of stuff um basically two internships and then two and a half three years um full time after I graduated and then that put me on the path to where like man I was working from home this was in 2011 right like before working from home was a thing I was working from home traveling a good amount like as a intern I stayed in a Hampton Inn so I was like Platinum at Hilton as a junior in college you know um so stuff like that right like the guys that I flew with like um they were all gold on Delta my boss hit Platinum by like August every year in a lifetime uh Sky Club membership because you bought it on uh NWA you know before they merged with Delta he bought the lifetime uh that's how much this guy traveled like wow our uh we flew out of Louisville airport and so we'd have our polos on with the company name and they're like Hey where's your boss you know that's that's how like much this guy traveled right and so but in doing that like I got to see a ton of stuff I got to be a part of a you know a growing organization but really I got just burnt out you know I'm working from home I'm doing reports all day long that's because at the end of the day that's all we're giving right is a as a pack of stickers we'll go and put them on the the gears so that everybody knows what to wear when they open this gear up and then we're giving reports and recommendations on how to basically become safer and reduce your risk when opening a piece of gear in your plant right Infuse changes breaker setting changes you know replacing gear whatever that might be and that's effectively what I did for a long time and I just got to where I was really good at it I didn't have to think and I'm a type of guy that needs a challenge so from there I ended up getting a job at a local in Louisville is where I lived at the time um job as a engineer working in architecture and engineering firm completely foreign but because I had so much power system experience like the rest of the stuff was pretty simple for me right like I've seen and analyzed you know hundreds of Power Systems I knew what Breakers to put in I've been in these plans like I understand how things got older you know condo got put up like I've never done that myself but just being in these facilities and having to trace out lines to figure out connections of all this stuff like I learned a lot and working directly with electricians right we're pulling panels covers off I'm in all the gear I'm doing all this stuff and it put me into a spot where you know I could go and really have an impact immediately in an architecture and engineering firm right I didn't have my license yet and kind of it simultaneously as I'm moving over to this other firm I'm getting my MBA so fast forward a year and a half two years I get my MBA and pretty much my PE simultaneously and with that when you on LinkedIn right PE MBA like now I'm getting hit up to go and Lead departments right and so like all the work that I did at that first firm because I had such good experience because I had talked to owners because I pretty much could handle myself in meetings I led a project for two dorm Renovations for Berea College as the electrical guy on it we had a terrible contractor so I got more face time than I uh would have otherwise right had the contractor been great and things hadn't been screwed up I wouldn't have gotten anything but because they were so bad I went very often to do meetings and show up and you know help out on a lot of the problems that were going on job sites that gave me a lot of exposure to these projects we did a lot of work for Ford the Kentucky Truck plant there in Louisville so I got to work on some of that we did work for brown Foreman so I get to work on parts of those um for a while I think I did like 10 restaurants for like World of Beer that we were just cranking through so I got a lot of experience there and that and all of that was in Revit and Bim and this whole world of 3D modeling then I basically got a job leading a department so you know I did you know a good chunk of work there probably 50 million worth of work but then when I went and led a department of nine guys under me all electrical designers we did uh this is where like I did all the K-12 stuff you know a small project for us was 20 million bucks right at elementary school so the scale really started to to go and because I'm the overseeing like engineering record right that's all my projects so we would do like every guy would do basically 300 000 square feet of work a year maybe 450 um depending on they usually have a large High School right it's about 300 000 square feet of uh project plus all the grounds right all the ball fields all the football stadiums all the parking lots entrances all that kind of stuff and then they would probably do like maybe another small like elementary school right another 100 000 square feet of project in there and that would be like all the guys so like six of them would do you know three four hundred thousand square feet a year and over my couple years there I mean we just did a lot of work right we did five 600 million in construction value it's because of the sheer volume of one I was leading the department so I you know reviewed and signed and sealed everything for them and then you know we did stuff in um all over primarily in the midwest Indiana Ohio um and then some in Michigan uh Louisiana we did a bunch of projects down there we had a few in North Carolina so kind of all over and then for me I got to a point where I really wanted a little more um you know things weren't quite moving the way that I wanted to and I was just I was young right like I'm 25 at the time 26 right I'm licensed I've got my MBA like I want to move and go and that's just not the rate that uh engineering firms and architecture firms move so I ended up going to uh MEP firm again recruited me right like I didn't seek these people out when you have like these credentials like I get headed all the time um so I ended up going to this MEP firm it was kind of across the street and ended up two months into that prod or into that job the project manager for healthcare ended up quitting so there were basically two engineering firms that did all of Ascension uh healthcare's work in the state of Indiana firm that I went to is one of them and effectively over that you know 10 months that I was still there like we I did 100 million in construction uh for healthcare we did like five six outpatient facilities you know Primary Care stuff with CTS and x-rays we did a bunch of X-ray Renovations we did a or renovation you know that's 30 million right there um and then just a bunch of like in-hospital stuff um x-ray replacement CT Replacements all that kind of thing for Ascension uh Healthcare in Indiana so like that experience you know and I got shoved in these places so what ended up happening with like me getting shingles was I came in as just a senior engineer I wasn't really supposed to manage anybody none of that just to be the licensed engineer record for the office so sure I'd be reviewing projects but I wasn't going to like manage people's schedules anything like that it was a 14 person like satellite office for the company so it came in thinking that and then all of a sudden I'm a department head all of a sudden I'm a project manager for like the largest account in the office I'm still signing and ceiling drawings and reviewing stuff for everybody else and you know like because we don't have the the staff and the people I ended up you know doing a lot of my own design work and Revit and Bim because that's my background I can you know utilize The Tool uh to put out drawings and I kind of had to so that's like it all culminated and then on top of that you know massive deadlines for what was my first Healthcare project and then it just happened to be you know or renovation so that's I mean so much right I mean it's it's crazy to hear how one thing just morphs into another and stuff like that you know and it's crazy and I want to touch on one thing because it's something that we can relate to in our industry when you started talking about the panels right so some guys when we get into big commercial aspects and stuff and we're doing our floors concrete polishing permanent grinding right we're wiring in 483 phase um most guys if they're doing it right they always hire an electrician to do it right some guys have gotten hurt by doing it but um that was one thing that as you mentioned the opening the panel and seeing that type of danger it's always been something on the top of my head when I go into these big ass commercial projects yeah so a couple things there so more people die from extension cords in their garage than anything else when it comes to electricity oh wow so just let that sink in right okay like most people like most of the electrocution right so you've not been electrocuted because you're still alive let's just make that clear so you're you've been shocked so most actual electrocutions right where they actually die it stops their heart are from frayed extension cords in some guy's driveway as he's working on a car sure extension cord across his chest I mean just done wow that's that's number one number two is lighting lighting is usually the other place where most people get uh hurt right so and and um commercial projects right it's taken off a ballast all that kind of stuff is where uh the injuries happen and then you gotta remember too like utility work is inherently less dangerous than industrial work and the reason for that is when something explodes on a utility pole it goes in three directions right it's it's a sphere out from that pole when you do it in uh industrial setting or even your home panel and something explodes the full force of that blast is coming right at your chest right and you're 18 inches from it so on a utility pole you're getting a small like sliver of the sphere of energy wave at you so you know in the really big year with big PPE that you really should never open they have it to where it's a ballistic rated like chess piece so that basically in the way my whole boss explained this is it's just going to give you an open casket funeral you know your chest is going to be caved in from the shock wave or you're going through the wall the brick wall behind you behind you so like when it comes to electricity like this is why you hire electricians right you can't see anything you know you're not testing stuff you're not pulling out your meters you know and the little idiot lights you know did you test it on a live uh outlet that you know Works before using that little Idiot light indicator that the circuit's hot so when it comes to the safety for electricity you know you test your meter on a known working Outlet then you go to the thing that you need to make sure is dead and make sure that it's dead right and then you have your lockout tag out procedures to make sure that nobody can turn it on right whether it's a single breaker lock or you know you need to lock out the full panel so all that needs to be done and you do need to wear PPE while you're doing lockout tag out procedures so for those guys that are doing it you know not on a breaker but if you need to like get into a panel or anything like that to verify that it's dead you do need to wear PPE because again if you drop your leads or anything like that in the panel there is a potential for it to you know blow and a lot of this is making sure that you're wearing the right clothing I mean we had pictures of guys that wore like track suits right and they went to reset a breaker just a simple breaker reset turns out the breaker had been reset like 20 times was wearing a tracksuit on a Saturday you know came into the plan after his uh or on the way to his kids soccer game hit it flashed on him and wearing a tracksuit he just became shrink wrap whoa and then they had to now he's in a burn Ward for you know weeks months to scrape all that off of his skin and peel it off because it just it shrunk her out right to him damn it's terrifying so guys yeah listen to that segment again right there Safety First when you're working on these panels and doing these big commercial projects like these big ass Grinders so um but it's enlightening I mean it's terrifying but it's enlightening when you think about it yeah and while that's why like in these big commercial projects where you're you're plugging into a like a welder outlet with a 40 plug right like that's pretty safe right they've made those plugs and everything and just make sure on your gear right nothing's loose no wires are Exposed on the end of that gear actually like pull from the plug don't pull from the cord right that's how you rip a cord out from the plug to where you know now Something's Gonna short and you know again you're dealing with chemicals right like is it flammable you know if something shorts at that you know and it leads out now you put a building I mean this is like super worst case and this is as an electrical engineer like all the stuff that we deal with right like songs it works it works and we design for worst case scenarios but it's just these little things to like be aware of right you pull from the plug not from the cord and that's gonna save you and replace your plug and cord you know someplace down the road well it's important too because I mean I want to touch on this a little bit too because again in our world where we have On Any Given job site we're only typically dealing with 110 maybe 12 gauge or 10 gauge cords right so we always talk like our Grinders or vacuums these are 15 amp you know it's not a big commercial stuff but it's still we're plugging into generators that could be you know 15 000 KW or something like that but again what do we have three to five extension cords running around the ground at any given time we're running Grinders right and stuff like that and then again it's classic where guys some installers don't care so they're just taking the equipment put it on the shelf right so then again you're not pulling from everything you're talking about eventually you're that loose cord or that connection's not quite made and eventually it's going to happen and we see it a lot with like a Grinders not working right or electrical cord popped out of a vacuum or something like that cool you can fix some of that stuff pretty easy but it's neglect on the equipment that's going to cause a problem yeah and don't buy like the cheap 10 extension cord you know you guys are in wet environments you know like stuff's going to get on them you know get the 25 or whatever they are now like heavier Duty cord right you don't need a heavier gauge you just need a heavy duty cord it's got more insulation on it is all it comes down to and then you know really inspect your uh extension cords just like you'd expect inspect the rest of your equipment again like working in somebody's garage doing this it's it's super key to to do that right worst case like something you know Sparks catches the chemicals on fire now somebody's garage is on fire right now you got a chemical fire to put out you don't have a chemical extinguisher more than likely with you right so that's probably something else sad to your truck but this is like the simple stuff right plug it into a GFCI outlet right those little reset Outlets to make sure because again you're around water you're around chemicals you're outside you know or in the garage right like those things need to be done and it's just a little simple safety thing that breaker is going to react far faster you know in milliseconds than you could pull the cord out of the the wall right so if something did happen you know power's gonna get shut off quickly and simple little things like that is Gonna Save Your Life potentially well let's use that as a segue into who the safety brief we just got done with now uh into the into the the current I guess right so the present so obviously you know managing it using all that experience you got Headhunters coming after you doing all that type of stuff um pretty much go work anywhere traveled around the country um so what are you doing currently right so how did Cowabunga Studios start why did you want to choose to do that over going to work of nine to five you know kind of leading exactly kind of what you're doing right now yeah a couple things culminated obviously shingles is one of them I'd just gotten back recently with uh long distance girlfriend uh who lived in California and I was in Indianapolis at the time and so that took me to like I had basically a choice to make right am I going to be with this girl and move to California right as an engineer she's a geologist like her work really doesn't move so you know how am I going to make this happen I've had this software thing I've been working on I've hire developers you know we're starting to get uh kind of beta and prototype of it I've had some interns work on it a company that I worked for previously didn't really want anything of it so I've got this idea this thing right to automate uh how we do designs right how we lay out buildings how we put things together and so fast forward you know moved to California when my year was up so I didn't have to pay back my signing bonus you know it's like a year and a day perfect yeah like I wasn't I didn't want to have anything like that like I knew I don't have a job I don't have any you know projects on the horizon like I just took the leap of faith of get putting all my stuff in my car and driving to California wow so and you know we live outside of Yosemite in the kind of Foothills of the Sierras and so you know and I'm married now so that whole thing worked out but the really in taking that leap was like a job came through like a week after I moved out right like modeling project where I worked on the Facebook headquarters in Seattle you know like stuff came through and have has gotten me through and that's kind of been really sticking through everything is you know through the pandemic right like I went to launch my software had meetings with the biggest companies in the world of you know multi-billion dollar uh engineering and construction firms had meetings with all of them in January February of 2020 uh covet hit and you know then they have you know billion dollar projects go on hold right they have stadiums that aren't getting built and you know it just turned into a ghost town and try to get software out there and then the last really three years has been um just a struggle in change management right and these firms are so busy in getting projects out you know construction is at an all-time high and you know we the industry has a plethora of problems right like me they're stressed out they are retention is not high right there's 10 plus percent turnover in every single firm um so everybody's stressed they can't really hire any people they don't have time to train anybody because they gotta just get projects out the door and you know then a lot of the Old Guard is retiring you know as they should right they've been in the business for 30 plus years most of them and they're just they're ready to retire you know like any normal person should be right so and they deserve it you know they've been dealing with this for a long time so uh it's really been hit with a ton of ton of issues right all the old Talent you know and knowledge centers are leaving the um people are harder to bring in right engineering is like not an easy one it's not easy to become an engineer two the Demand on an engineer in a firm is high right there's probably a lot of easier paths oh yes uh but the stress you know again like 750 million in construction value like that weighs on our shoulders right like proven change orders getting projects out the door like the dollar volumes that we end up dealing with or pie you know so it's a lot of responsibility and risk and you know trying to keep the owner happy through all of that and the general contractor and then really just training you know like nobody has time to train the new guy uh which I know that's where you come in Pete but like nobody has time to train the new guy they're not going to take a week out of their when that new guy comes in right to hire them they're not going to take that week to really train them they're not in being virtual it's not like in the old days where you just hey you're sitting next to Steve for the next however long until you learn this stuff you're not shadowing yeah well or just like listen to his phone conversations I mean that's half of what I did was I just sat next to a engineer you know and they moved me and him like around the office and stuff whenever we had to move but like I just listened to his phone calls right I helped him out on his projects I went through and he taught me everything I need to know on how to model stuff in Revit so and that just doesn't happen now with you know the remote Workforce or people are now having to go back in the office and they're like ah I gotta commute you know I'm tired of this like I got used to having a commute or anything like that so with Cowabunga Studios what really I've transitioned to is to just just take that workload off of the engineering firm's plate right we'll get you through 75 CDs and what that means is like everything's going to be circuited all lighting power fire alarm low voltage Data Systems like all the systems are going to be modeled circuited annotated done for you and the reason I'm calling this 75 CDs is because everybody has a different definition of what you know any percent is on a project you know is it 90 90 95 25 50 you know pick a number but really to get everything done and then all that's left for the engineering firm is final coordination um between all the disciplines specs and signing and ceiling so really to to take them you know most of the way there I know that final coordination can be a bigger thing and specs are obviously a big thing and signing and ceiling is obviously a big thing and you know I can take it all the way but to give those firms really to take the bulk of that work off their plate so that really they just end up reviewing final coordination final um details to work through and then they can ship it out the door really to take that off their plate and it's you know Pennies on the designed fee you know it's a small percentage of what their design fees would be right so the design firms right so you're building a hospital per se and it's called 20 million um that design firm then hires Cowboy Studios and kind of designs it out right takes that stress off of their play right they got the other crap they got to worry about right you give it to them 75 complete could finish more if you need to stuff like that but you're kind of the middle man but in reality you're taking the bulk of the work off of them is that kind of what I'm getting yeah I mean like so most of most firms are I'll call it top heavy even though that's not really what it is but they have your you know account executive your project manager your senior Engineers right or your licensed guys and then below that because Bim isn't really taught in schools and then you do need to have an engineering mindset it's not like the old days of CAD or hand drafting where it's like here's a picture just duplicate this picture you know a thousand times across this for these rooms right like just duplicate this in every single room and you know go forth and draw today it's that element needs to be at the right height it needs to be circuited it needs to have all the right information behind it because we're going to schedule it right so that element whether it's a receptacle a light a piece of concrete a floor a wall door doesn't matter it has a database behind it so you're now no longer just a drafter your engineering and designing as you go through a project so the level of talent that like the technicians right the bimtex cad texts need to have is so much higher today than it ever has been because of this like everything matters throughout the entire design process so that technician needs to like understand some basic engineering principles and putting stuff in because they're making design decisions simultaneously as they're drafting So to that point is you have all this top talent right you have your engineers you have your uh project managers you have your account Executives you know or rainmakers in the project what you don't typically have is a good drafting resource you know and that's what everybody refers to it as but like a good design resource to go and execute these projects right the engineering you know and all reality doesn't take up a ton of time it's all the drafting work that takes up the majority of the project that just can't get done so an engineer can review it present it to the client have a discussion make changes and then go back and make those changes in the model so then go forward so then what I'm doing is keeping engineering Engineers engineering and being client interfacing then you know going back into the the cave and you know being chained to their desk for however long to get these projects out the door right and I've seen that on some big commercial and projects too right so I've been in the where it's still framed up electrical contractors are in there right and they're doing all that and wires for miles and miles and miles and stuff like that and again on the floor side of things we deal with a lot of outlets and stuff in the ground obviously and stuff too right so I mean I'm processing through the concrete mindset and the installer mindset of what we do of you know if I'm going to pour the concrete or I'm going to coat the floor or whatever that is you know I still need to work with you guys or the contractors at some point or there's outlets in the floor there's electrical coming somewhere that we can't hit touch get wet and do whatever that is so it's at different phases because it's obviously the electrical has to be in before the concrete goes in um so I mean there's just there's a lot of different subcontractors I would assume that you got to have to deal with and you know right that have to do it on the flooring is one side of it right yeah so I mean like on the and this is kind of like a disconnect if you will so let me try to help spread the Gap here is you have your architecture and engineering firms right and in that there's there's thousands of hours that go into design right so electrical loan which is like 10 of the design of a given building like so take that 300 000 square foot brand new high school that's 2 000 hours of design just electrically right so that's two guys you know for six months full time that is all they do on that project right they just work on that uh usually it's more than that because I got other stuff but it's like an eight ten month design phase there's you know three guys on mechanical there's another two guys on Plumbing there's probably another three doing all the low voltage systems there's probably like six Architects full time on that project right then you have structures got another three or four guys on it civil's got a few on it so like and then you you just start to do the math right this is tens of thousands of hours to design the project before dirt one moves yeah and then when you go into the project right because like when I step onto a job site I have more power than pretty much anybody you know like especially in when I was doing the healthcare stuff because I was the mechanical electrical Plumbing uh project manager so is the representative of all the engineering so me and the architect have basically like the power on the job site right to make granted all this has got to be documented and paper and all that kind of stuff but like we are that in the the GC you know own that job site right like we are we have so much power walking on to that but again it's to know that like we need every contractor to be on board with what we're doing right I can't just go lording around stuff especially like I get it I'm young you know in my early 30s now but I've worked with all these old guys and so you just give them the respect that they deserve right and what they're doing tell me what your problems are let's figure this out let's work through it and once I know what your problem is like okay like I might not have a solution for you right now but we'll get you one we'll get you a solution to whatever it is that you're dealing with to make your life easier right horse Trading still exists whether people want to admit it or not you know it's like that old boys network but it's like you do right by me I'll do right by you we're not gonna screw each other in this deal we need this project to like go through quickly I know you got to get paid for some stuff I know you don't want to do paperwork on other things so let's just Swap and get it done and everybody's good with it but to the point of like you know for trade coordination it's so important to you know understand and be able to read a set of drawings right especially on Commercial uh projects so especially like in the the concrete world there's a lot of floor penetrations right and you the worst or the thing that you don't want to have to do as a granted you're probably not going to cut uh through it but you don't want to have to go and x-ray every single hole that you cut in that project so on these big commercial jobs what's happened is they're using like total stations and all the scanning technology to know in that floor where every single piece of rebar is so that you can now is like the electrical contractor that didn't get their [ \_\_ ] together and put a box in to for the concrete pour um to hold that spot of for the floor box right I know where I can drill and where I can't to put that floor box in once the concrete is cured and I can do it without hitting rebar right I can go look at my model we use a total station and Laser point to figure out where I can actually cut now because I you know missed it before the concrete pour to put my box in so that you know we can not have to cut through concrete so trade coordination and the complexity of it especially in the commercial world you're and you're working up two three four floors to now you know where they're laser scanning everything you can see where every piece of rebar is and then for you guys to look at every piece of um you know rebar if you need any of that and concrete polishing you guys probably don't need too much of that but to at least understand you know where electrical out boxes are or just any floor penetrations or sleeves or anything like that for fire stopping or pipes or cable trays or whatever else that might come through the floor yeah that's huge I mean we don't I mean we're not really core drilling at least my guys typically off but polishing right he's got it you still got to be able to look at a set of plans and realize hey I can get down this 2 000 square feet at a time this is a hallway this is going to be a bathroom they just got they just put in piping or this Outlet so I mean it's complex and um it goes along those same lines and it's it's funny you mention that because literally the episode that we shot right before this was uh a gentleman who's been in the construction industry for 43 years when he talked about how he was a young buck on job sites in New York City having to be in his 20s and talk to these 50s year old bears that are you know stubborn and uh there's a there's a right way and a wrong way to do it and like you said there's uh there's horse train that goes on you got to Pat each other's back so we had that conversation it was pretty funny um and there's one thing you touched on too and I want to leave this in now as we talk about the future okay so I want to kind of touch on one where do you think the industry is going right so the economy's changed since covid right we we know exactly what's happening with the big Builders kind of put some stuff on hold now it might be changing so where's the big commercial industry going right so how do you how do you guys see in that and then like what's your plan for Cowabunga and how are you seeing that what's your thought giving away your secrets like what's your future um so I I see this in a few ways and I've kind of and I put this out there years ago but I see a hybrid work model right and we're seeing really that come into fruition so what does this mean for you and your guys uh so long as people can afford it their houses are going to get bigger right they need another room for an office right or they're going to do something in the garage you know which is perfect for what you guys are doing um I see that that's going to be a thing that's here to stay in the whole work remotely hybrid roles that kind of thing which also means that office spaces can be smaller um you know I've been into some larger organizations here recently and you know they come in the office like two days a week you know outside of that it's a ghost town so then you can really start to look at your density of office space and office space is going to get reduced now there's still going to be a need for it um but I don't think to the extent that it was and a lot of office spaces now are getting turned into Condos for you know because again you're downtown people like being downtown they want to be closest stuff and then if they're going to work down there you know they'd rather have a condo so I see that I see in institution work that's going to be continue now higher ed is going to be a tricky thing because enrollment's down in most higher education so for your institutional work Grant it's still going to be there they still have endowments to spend you know they still have money to to get through every year but it's probably not going to be at the levels that it was now hospitals and health care they're still going to do on their trajectory again they're funded primarily by Medicare Medicaid not like private insurance so all that money is still going to flow through the pipeline for healthcare institutions so that that work will continue we'll see a lot of road work and those pieces to continue and then you know other big infrastructure projects you know there's going to be airports and roadways and bridges and all that kind of stuff is always going to be there like I don't see that going away and in California [ \_\_ ] man Caltrans works on stuff that is like nice and like there's no potholes you know I was back in Michigan and the the joke is the state flower was out in full force you know those nice construction cones that are everywhere it's orange season well an MDOT has no problems like uh ramp closed you know no no no no go here like don't even let anybody down just close you know you want to go on this road no good you know pick another right yeah and they're not even working on it well they're they're doing like around Detroit like 70 like every major roadway is under construction and they just shut everything down put everybody on one side and just so they can plow through you know putting in because it's all concrete roadways there um so they're plowing through getting those things done so I mean as far as the future goes like construction is here to stay you can't Outsource it you know people are going to be here the problem that we're going to go through is it's labor it's like I talked about earlier is a skill which you know Pete that's where you come in and training these guys to do it do it right um and giving them that skill to go out in the world and you know provide a valuable service to everybody as I talked about like engineering firms really don't have there's no training curriculum it's you know harder now to the osmosis method that they use really they didn't have to think about it right here sit next to Steve for the next three years um like that's not happening there's no real training curriculum uh everybody's pretty secretive if you will in any space like they don't don't share as openly as maybe in the Contracting space and world so I think labor and especially skilled labor and it's not something like as much as we've done automation there's to get to a perfectly automated building like Google tried this for architecture there are so many code regulations so many specific aha requirements so many specific site conditions so many specific budget problems so many products out there that like a Google isn't even able to deal in the built environment that's why Google Fiber doesn't go anywhere because they're like [ \_\_ ] this is expensive you know we make infinite margin on search and ads why would we do this whole like physical infrastructure thing so from that aspect you know really anything in the the services right which is why I'm my models transition all the services from software is services are what people want right they just want to hand it off hey you do it right which is why it's so important like especially in your residential side you know that's a service people could go buy a grinder they could go buy you know not your product but some other product and figure it out and do it but they don't want to right those people people don't want to build a deck they don't want to paint their house they don't want to like do a lot of things right or they don't feel comfortable even though they might have the skill they don't feel comfortable to go and do it so services are going to be here to stay for the ever like I don't see Services going away and then even to talk about like robotics especially in construction or like in people's homes like somebody's still got to go and deliver the robot you know and then in a construction site in a commercial world like the floor is not even you know like concrete setting the robot doesn't really know where to go yes it's mapped all that kind of stuff but like doesn't know how to drive over a stick or a broom handle that's left there or an extension cord or you know whatever else that gets left on the floor in a in a job site as clean as you want to make them right stuff like that still exists right they're going to bump into a pallet they're gonna you know knock [ \_\_ ] over and that is not it's not going to come for your job there's specific applications that robotics have been put into job sites but like the cleanliness of the site is like something you would never expect to have in under normal circumstances so at the end of the day like being a service provider being skilled in what you do being able to talk to clients like all those skill sets are not going away you know you still need somebody to talk to a client you still need somebody to sell a job you still need somebody to show up and be there you still need somebody to clean up the job site afterwards you know like all those pieces of of human interaction are not going to go away and you know let alone doing a good job but is to be a great service provider uh for your end clients and that's all Cowabunga Studios is focused on is being a great service provider for engineers contractors you know design build firms and helping them to really get their projects out the door faster lower effort they don't have to worry about training or onboarding or any of that stuff you know those are the things that I'm going to focus on bringing more people into Cowabunga Studios you know long term and really Empower my local economy here in the foothills of California yeah that's powerful um I guess curiosity for me is do you guys only do commercial industrial are you guys going to try to get into some residential like home builders or polti you know these big people stuff like that so interestingly enough you really just need a architect for most homes and then even in most Home Design you don't actually need an architectural stamp until it gets over like 10 000 feet so like in most residential construction you know a 201500 1600 square foot house 1200 you don't need a engineer sample of approval now there are a couple States like Arizona I think has to have an engineer stamp on it which is kind of ridiculous but whatever um so yeah like most of this like electricians you know or in in all reality most electricians are totally competent to to do a house you know it's not complicated wiring it's a standard 200 amp panel like there's a lot of stuff that has been codified effectively to where they don't really have to think about it you know like you need a dedicated circuit or two in your kitchen you need you know basically every room is going to be served together all lights will be circuited together the you know washer dryer HVAC unit hot water heater you know those get their own and like it it's not as complicated as we get into like commercial space and you've got life Safety Systems it's got to be sign and sealed you know you get into generator systems paralleling gear right like a lot of more complicated stuff and then in commercial you're also doing a design bid build you know or design build in most cases so they're going off of the drawings right it becomes a contract in those documents that's why they call them construction or contract documents CDs is you know that now becomes a contract as to what they build what they're going to put in what they're going to install and you don't have that in residential it's like hey I got a house you know this is what we want and you know you pick finishes with your general contractor and go from there makes a lot of sense um all right well guys we're going to kind of wrap it up so I guess um Dylan where can everybody find you we'll put links down below but um where where you where can people uh contact you yeah so I'm super active on LinkedIn um again just go the link below and hit me up on LinkedIn or follow me I put out a fairly regular blog there I haven't had um maybe it's more insightful things to talk about here recently but typically that's daily um Daily Posts on LinkedIn and then we also which Pete's been a two-time guest on uh the construction Corner podcast comes out every Tuesday you can find us there we talk about all things construction you know so from from concrete to you know General Contractors we had um a woman on to talk about like irrigation and doing a massive Home Building in Montana here recently so and in the the West so a really wide-ranging uh segment of guests right from guys doing residential to concrete to you know high-end homes to commercial to um really a little bit of everything so construction Corner podcast and Linkedin are really the two main platforms you know on Instagram and Facebook but more for like personal stuff so if you want all the good business content then uh head over to LinkedIn or listen to the podcast yeah guys I can't say it enough um the construction Corner podcast with Dylan and Matt um again I've been on it twice it was amazing so I'm going to look that below again it's everything construction based right so it's just like us and we're sharing industry contractor knowledge right so if you can't pick out something from every single episode that you're going to learn to grow your business around you're not actually listening so the links will be below um Dylan thanks again for your time I appreciate it um and I'm sure you'll be on again as uh we continue to grow this as well so um any last final words thanks for having me on Pete you know it's been a pleasure uh it's always interesting to hear from you and what you've got going on and then to see really everything that valence is doing in terms of um and I love it that you're empowering guys to to go out be able to provide for themselves their families you know grow a little business you know for themselves and hire some guys and you know again more and more we a lot of us can't change what's going on in the country nationally but we can change our local communities you know we can change at home we can start there um and just getting excellent you know guys start eating eating better drinking less reducing your stress all those kind of things are going to help not only your personal life but your business you know and I highly recommend to start some like 75 hard but again as much as we all get frustrated with what's going on in the world uh we can control a lot of things in our life and then again to put more into our local communities local charities local events hiring people locally you know bring on that high school kid that wants to learn you know that kind of stuff is uh going to be really impactful and just put your mindset in a much better place and listening to national news all the time yeah don't do that uh and we actually kind of reminds me we should actually do another one talking about the business coaching right some of the stuff that we've been into based off of that and putting it into the construction industry right because that's what we do right so we take our national level coaching right if you will we build it down to how it benefits us so I think we should do another episode just on what the coaching that we've personally been through and how we met um and how we implement it into our into your company and everything on the contractor side so I'm game all right well I'll follow up with you on that so all right guys again thanks to Dylan thanks for another amazing episode um guys um one last thing that we always end with is um we are having the concrete encodings Mastermind at the end of February so this is for primarily decorative concrete Coatings people but it's going to be something that's going to be in Dallas Texas dates are not confirmed but we're bringing industry people together three to five hundred people in the room for multiple days all learning about how to build and scale a business so guys keep in the loop for more information on that um you'll see Dylan again on that um but again it's been another amazing episode of beyond the creek podcast and again Dylan I thanks again and guys as like I always say I got you thank you [Music]"

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"VideoID": "649",

"Title": "How to bid a half million plus commercial electrical project. The 360 Electrician explains",

"URL": "https://www.youtube.com/watch?v=qacUe4SCCVk",

"Keyword": "Commercial electrical construction",

"Transcript": "hey 360 electricians a quick update we're in the office and the printer is moving uh we are printing 30 page plans right now i've got the team here you guys always ask in coaching how we bid projects so here just take a look i'll flip this around so here we go we'll get our projects just like this and it's got all our electrical plans on there just to give you an idea of what this one's going to entail let me show you let me show you there's one of the units right there hey rudy come on in look at that switch gear so rudy and i and the rest of the journeymen will be here we take out our notepads we got our whiteboard we'll go through each one of these pages and then we'll actually go look at the look at the units right here for all you guys wanting to get into commercial here is all our sub panels for example in this building fun stuff right so then we'll go to the actual floor plans i don't think we got there yet i think rudy's got it right there so here's the building itself we'll go through each one of the floor plan and what we do is basically we'll take each one of the floor plans the sections we'll break it down we will find out what we think it's going to take to do the job literally based on our experience we take those multiply it by the days we think it's going to take to finish the job we don't do the estimating software we don't count how many feet of conduit that's not how this works we will actually look at the job we know that it's 40 feet of conduit one inch with this kind of wire blah blah blah and we generally know that that'll take you know 30 days 30 days times our daily labor rate minus our discount for general contractors existing work and now we have a price for that section on labor we do that on all the steps each unit if there's 20 units that are like this and we say it takes five days to rope it finish it and blah blah blah we'll add that then we take all our material costs send it over to the wholesale house we write down all our material they give us a price we put a percentage or a dollar amount and that's it we can come up with 300 400 800 000 who knows that's how we do it and we can do it because we have the software we've got the programs we've got the printer look if you're looking to level up and get into commercial you know what to do hit that like button subscribe click the link below for coaching and we will see you on the next one"

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"VideoID": "650",

"Title": "Commercial Building Electrical Rough in and Finishing",

"URL": "https://www.youtube.com/watch?v=IcBlEU7wvqQ",

"Keyword": "Commercial electrical construction",

"Transcript": "foreign [Music] thank you [Music]"

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"VideoID": "651",

"Title": "Understanding Blueprints: Electrical Symbols Explained",

"URL": "https://www.youtube.com/watch?v=A1z1ZvLFvfI",

"Keyword": "Commercial electrical construction",

"Transcript": "all right apprentices I've been getting a whole bunch of people that have been wanting me to do this video to go over Blueprints and what all of the symbols mean so here we go [Music] so if you're an apprentice and you keep trying to go up to plans and your journeyman keeps yelling at you because you don't know what you're doing but you want to learn a little bit these are all of the symbols that you need to understand for you to really be able to understand the plan and what's happening I'm not covering every possible symbol that there ever can be but if you understand all of these then you'll be able to wire probably seven eighths of a place and then you'll be able to figure out the things that I didn't cover and like little weird things that some Architects use some Engineers use some don't a lot of symbols are different from plan to plan but this is the set that is going to get you reading plans and understanding what's going on depending on who's making the plan and what they're writing in a lot of people will have different ways that they annotate things different shapes and things like that but kind of in general when you're looking at a duplex receptacle it's the plug on the top plug on the bottom right one device that you stick in the normal thing that we see as a receptacle to plug into that's going to be the circle with two lines in it it's 120 volt duplex receptacle and we've got something that's a circle with three lines in it and that's usually denoting a three wire 240 volt or 220 volt plug 220 and 240 same thing just different areas of what we used to call it but it means the same thing so it could it could even say 220 under it or 240 under it like this one says here so you'll notice this is a three wire which means two Hots and a neutral over here this is just two Hots so that's a two wire 240 volt receptacle it would have two Hots on the ground it doesn't require a neutral so you might see just a normal plug and so that you don't get confused they might just write 220 on next to it so that's another way that you might see it another 120 volt duplex you might see it has the word GFI or GFCI written next to it that lets you know that's a specifically A GFCI receptacle uh then we've got CT written next to a receptacle CT means countertop so it means that these are receptacles that are to feed a countertop a lot of times in kitchens and like you know fancy utility rooms laundry rooms things like that you'll probably have countertop surfaces and you'll have receptacles on them so specifically they'll write CT so that when you're reading the plan you don't put the plug down below at knee height you know you'll actually put it up on the countertop another thing you might see is a receptacle with app written next to it that usually just means Appliance it's specifically dedicated for an appliance so a lot of times these are just dedicated receptacles meaning they come off of a breaker and go straight there they don't Branch out to 15 other receptacles they are dedicated for a specific Appliance or a piece of equipment another one you'll see is a quad so the hashtag sign right so it's got two lines like a normal receptacle would have but then it's also got two other lines and that just means it's two duplex receptacles right next to each other usually that's in a two Gang Box if you're in commercial it might be in a gangable box or it might be in a 1900 box you know like a four square box but it just means that there's two side-by-side duplex receptacles or four actual receptacles Quad 4 to plug into and then last uh we've got uh just another way you're probably going to see these either horizontal or vertical doesn't matter some people start the lines in the circle and then go outside of them some people like to write the lines straight through so it's like you know anything like that we know that that's a receptacle next we've got switches so switches um they're all going to be some kind of an s except for this keypad over here we'll get that to that in a second if you see a single s somewhere written with like a dotted line going up to a light that's a single pole switch if you see a little three next to that single switch that means it is a three-way switch and there's usually going to be two of them at opposing ends of a room then you might see four-way switch and a lot of times you'll have a three-way on one side of a room a three-way on another side of the room and then at some other doorway you'll have a four-way so you'll have an S3 S3 and S4 so lets you know you have to go from the three-way to the four-way to the three-way but it's just the four is letting you know that that's the four-way location we might have switches that are dimmers they have a little D next to them and some people write the the numbers up top some people write them down below so instead of super text they might be subtext it doesn't matter either way a little D next to a switch usually means dimmer now a lot of times they won't write it at the switch they might do something up where the light is written and then I put dim so that you know that that light is dimmable but most often you're going to see it at the switch if you have a few switches stacked next to each other that's going to be either a single switch a single gang box um two Gang Box three Gang Box four game box it just means two switches three switches four switches now you also may have of like one of these might have a three next to it and another one might have a four next to it so you could have a single pull switch right next to a four-way switch next to another single pole next to another three-way switch it's very common um but that just means you're in a four Gang Box uh we have 220 switches so there are switches where you feed two Hots into them and two Hots out so it's switching a 220 a 240 volt load so it'll usually denote 220 next to it um then we've got keypads so a lot of lighting Control Systems Lutron you know homework systems um you could even have radio raw 2 systems control four there's a whole bunch of different lighting control systems but typically when we lay out where the keypads are going to go on the plan we write keypad in specific locations and then all of our switching is usually done in like closets or something like that so it hides where all of the actual radio Rod devices go unless you have a homeworks panel and you're not going to have all those switches you'll have you know RPMs in a like a whole multiple panels set up for the lighting control system but you're still going to have to know where are the little touch pads throughout the house so that we know how you know each scene that we're setting up and where all these things are controlled they're controlled through keypads so if you see a KP with the Box around it that's keypad and then lastly we have occupancy sensors so sometimes people will want um you know like a pantry or a laundry room or a garage or something like that to be on an occupancy sensor and that just means when you walk in this occupancy sensor sees motion it sees you come into the room and it turns the lights on and that way when you leave it'll time out after a few minutes and automatically shut off on its own my kid used to leave lights on all the time the girl she go out and do laundry and then just leave the lights on so actually I put an occupancy sensor in there so they would automatically shut off and automatically turn on so you'll typically see a little OS occupancy sensor next to a switch next up we have lighting so there's a whole bunch of different kinds of Lights there might be even variations to these and there might be more of these as well but these are kind of the the general ones that you're going to see the most often so this is a hanging light you might see the word Shand just written underneath it or you might see like the full word chandelier so it lets you know that this specific hanging light is a chandelier you also might just see pendant like p-e-n-d written right next to it sorry I did that in red to make that all confusing but you'll you might see a little like words or something underneath them and it lets you know like this is a chord pendant so it's just a light hanging from the cord with a little glass thing and a light bulb in it and that is one kind of light so you know as an electrician what you how much weight that's going to be and how you need to support it and everything and then if they write chandelier you know like oh I might have to upgrade this to a fan box a fan rated box something that's heavier duty to be able to hold the weight of a chandelier so they'll usually denote that on there or most of the time any hanging light that's not heavy will just be this simple and anything that is heavy we usually have something written so that you know that it's heavy then we got wall sconce so anytime you've got a wall you got one little line and a circle coming out that means that it is something that is wall mount that's going to come out of the wall and hang so a lot of the vanity sconces that you're going to have in bathrooms above mirrors you might have like garage sconces on the outsides of the garage so when you're pulling up in your driveway you know you've got life but anything that's mounted on a wall is going to be that simple then probably the most common symbol you're going to see in most jobs I don't know any houses that don't do recessed cans anymore like everybody does it so that is a symbol for a reset scan it's a square with a circle or a square with a hanging light symbol on the middle of it then you'll probably notice much smaller ones so you might have two different sizes on a plan unless you know that one of them is the full size probably like a six inch five or six inch recess can and then a mini can is going to be either like a three or a four inch so it's just much smaller and a lot of times they're put into cabinets or they're put into like built out Niche niches niches on that note is Niche and Niche two different words [Music] thank you [Music] okay so then we have mini can and then you might see another kind of candle with a WP next to it WP just means weatherproof so a lot of plans good Architects will actually take the time and let you know all of the weatherproof cans that are outside on porches and patios and stuff like that and I'll write that a lot of times they won't they just draw cans everywhere and it's up to you to figure that out and most LED trims nowadays are sealed so they can be used weatherproof or not most of them are just rated that way but not all of them so you have to be careful um we also have cans that have a d next to them so like I was saying before we have a switch with the D next to it to let you know that that's a dimmer or you can just have a recessed can or a light that says D next to it so you know that the homeowner wants these lights to be dimmed or dimmable uh next up we've got a track light so sometimes you'll see this with more heads like six heads so it lets you know we want lights shining out that way and down this way but sometimes it just might be coming off one side so that is a track light most of the times those are put in closets nowadays but in the 70s they were put everywhere in kitchens like people use track lights everywhere was like the most modern cool thing to have track lights I hate putting them in God I hate track lights uh okay so then another kind of can that you're going to see is directional so there's a few different ways that a directional can can be written it's a normal can with some sort of variation of an arrow pointing in the direction that they want the directional can so it's not a downward can it's a can that's kind of tilted a little bit and it's pointing in a certain direction a lot of them you can actually change and kind of move which direction they point but it's actually letting you know with the arrow where they want it pointing on the plane or some of these are like filled in so you'll have a circle with like a little hole over here and then the rest of it's all filled in and then it'll have an arrow coming out of it to let you know like the little Port that the light's coming out they want pointed in a certain direction anyways you might even not have that you might just have like a regular can that says dir and it says so lets you know that's directional but usually they'll still include an arrow you know which which way they want it to direct and then the last two we've got under cabinet lights and above cabinet lights so a lot of uh kitchens you know big Custom Homes they might spend a hundred thousand dollars on just kitchen cabinets alone and so a lot of times they'll have in cabinet lighting icls which I guess I should have put on here it's gonna be the same thing but ICL in cabinet lighting under cabinet lighting above cabinet lighting and usually they just they put one of these under each cabinet so you'll see on the plan like several of these little like I-beam looking things and that's to let you know that there's some kind of cabinet lighting whether it's above it below it or in it next these are some miscellaneous things that you might see there's probably several things I should have put on here as well like disconnects and things like that but um we've got an SD smoke detector uh you'll see smoke detectors in bedrooms uh outside of bedrooms any room essentially that's got a closet in it um you'll you know one on each story of the house there's a whole bunch of different places that you can put smoke detectors it might have an HD instead of an SD which means that it's a heat detector instead of a smoke detector you might see something that says combo like SD with a combo next to it so you know that it's or it'll say like CO2 because there are some codes in places where you have to have combination smoke detector and carbon dioxide detection but anyways it's going to be some some sort of thing like this this looks like a ceiling fan because it is a ceiling fan that one's pretty easy to get if you see a box with a j in it you'll see this a lot in commercial and that just means junction box you might see JB or J but it just lets you know run a home run to this location stick a box somewhere just leave the wires in it so there's a junction box available for maybe some equipment to hook up to that's getting hardwired to it rather than you putting a receptacle in it because if they wanted to receptacle they would have put the receptacle symbols so a lot of times you'll just see a j for j-box and that means later we're going to hook something up you might see the same thing just with ls so a lot of times big houses will have landscape lighting they'll have low voltage lighting out and flower beds and stuff like that and so typically we'll run like a 12-3 from a switch location so we run the black as a constant hot and then the red will be our switched leg and so we'll run a neutral a switched leg and a constant hot all out to a junction box outside for the landscape that way if they need constant hot for anything it's there if they want something that's switched we can put it on lighting control we can put a radio Route 2 control on it do a whole bunch of different things with it but I like to give a constant hot and a switched leg and make sure I have a neutral out there so that's how a landscape stub is usually denoted you might have one at all four corners of the house or something like that and then we've got vent fans so in the bathrooms you know you've got a fan that turns on to suck all of the moisture and other stuff out so that's what the little yin yang symbol looks like it's not actually a yin yang they should do it like that I think that's cooler and lastly we've got some commercial stuff so definitely not everything commercial but some things that you're probably going to need to look out for as you are apprent to saying you're starting to kind of get your your feet under you uh you're going to see receptacles that have lines that have other lines coming off of them and there's going to be numbers denoting something this in commercial settings the engineers drop the plans so they will actually write the home runs in for you so you don't have to figure out where all the home runs are and so they'll have l145 or l146 L2 whatever it just means it's panel L1 because usually in commercial you got like three eight panels you know tons of them and each one is going to be you might have an H1 H2 L1 l1a l1b you know a whole bunch of different things so anyways just lets you know which panel you're in and then which circuit number which breaker next we've got this like thing that's half filled that's a night light so a lot of times on a plane you'll have a whole bunch of 2x4 uh light fixtures like in kitchen or wherever in an office building and you'll notice like every three of them are like half filled like this where the rest of them are just a rectangle so that means that these are Night Lights which means that they stay on when everybody goes home at night they're just constant power all the time so a lot of times that's just so that you can either keep light in there at night so that nobody messes with the place or it's for e or S so that you can get in and out so if you have to walk through a dark building just to turn lights on that's not very good right so having some kind of pathway lighting or you know just general lighting for people that are employed there to be able to get in and out you know at night or in the mornings they'll have Night Lights we also have emergency lights you can have emergency lights that are two by fours sometimes you'll see an em next to something to like denote that it's an emergency light and again you're not gonna have every one of them there's going to be every few within a room that are em lights um but these are specifically wall mounted frog eyes so it's got a big battery pack and two eyes and those eyes you can kind of move around like a frog's eyes and point them wherever you want so if power is lost there's a backup battery inside that kicks on and provides enough you know 12 volts batteries six volts of battery depending on what kind they are and then they'll shine out light until the battery is run up might be like 30 minutes 60 Minutes 90 minutes something like that but it just gives you some general egress light when power is lost um and those are wall wall mounted then you'll have something like this that is an exit sign so every door that you can get out of the building has to have an exit sign on it so again there's a battery inside of it that if power's lost these lights come on and it kind of shows people in the dark or if there's smoke or anything like that you can kind of see where the where the exits are where the egress is and then they combine two of those sometimes to have a combo exit emergency light so there are some situations like maybe in a bathroom you're going to want an em light but you don't need an exit there's an obvious door right next to you you know like you know how to get out or in some kind of a hallway that doesn't actually have an exit you might still just put frog eyes but you don't need the exit part of that and then if you're like at an exterior door and there's an exit sign but there's no other light anywhere around a lot of people will put combo em lights and exits so at least you can see the exit but it's giving you some X extra light as well it's shooting light out so it's just better to be able to get out and to be able to see where you're going while you're trying to get out so that's pretty much it those uh if you're again if you're apprentice and you're just trying to figure out Blueprints and stuff like that um these are the things that you probably need to be the most concerned with so that you understand what's going on in the plan I think if you can understand most of these then you'll really understand the weird little idiosyncrasies the little different things that I haven't covered because a lot of times too they're just in the notes if you just go through the key or the legend most of the symbols are denoted as to what they mean so if there are symbols that didn't cover which there definitely are push buttons Chimes you know doorbells stuff like that there's all kinds of stuff that I didn't put on here but you'll be able to figure that out so this should at least get you really far though like wiring houses running over the plan looking at things understanding what it's actually talking about so you don't look stupid in front of your journeyman so anyways let me know if you guys want any other videos similar to this liked it hated it whatever lose comments below let me crazy people we'll see in the next one"

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"VideoID": "652",

"Title": "Barts Electric at Work - Electrical Expertise in Commercial Projects",

"URL": "https://www.youtube.com/watch?v=rCpzSzDMeUo",

"Keyword": "Commercial electrical construction",

"Transcript": "so we're in building five right now it's the finished Warehouse that we did um we did all the lights all the fans all the rooftop units all the gear basically everything inside of this Warehouse is what we've done it's a little over 500 000 square feet the ventilation the firearm the fans the it cabinets all the plugs all the dock doors that are blinking all the gates"

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"VideoID": "653",

"Title": "Commercial Electrical Contractors Lakeland FL",

"URL": "https://www.youtube.com/watch?v=6m1j9wD74bU",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] if you're looking for a reliable professional and affordable electrician well you've come to the right place we're proud to be the top local electrician service and we are committed to creating satisfied customers no matter what type of electrical service or installation you need done we can do it all call our email one of our friendly staff now to set up an appointment [Music]"

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"VideoID": "655",

"Title": "Electrical Designing of High Rise Building G+10 | Electrical Design Course",

"URL": "https://www.youtube.com/watch?v=z6\_7jpO8zPE",

"Keyword": "Commercial electrical construction",

"Transcript": "guys my name is Amair and you're \nwatching electrical infinity   in this video i am gonna explain you about \nelectrical designing of a high rise building   in other words designing of cheapness 10 first \nof all we need to go through some basics and   standards before starting designing steps \nhere in our case which is g plus 10 g means   ground and 10 means number of floor which has \nmultiple number of 2b hq 3vhd and 4bhk flats   whereas bhk stands for bedroom hall and kitchen \nand the energy meters we use for these flats have   some standards according to government for \ntwo bhk flats we use 5 kilowatt energy meter   and for 3 bhk we use 7.5 kilowatt energy meter \nwhereas for 4 bhk we use 10 kilowatt energy meter   in addition to this for vlas we use 10 kilowatt \nenergy meter for 3 bhk and for 4b hk we use 15   kilowatt of energy meter now let's start working \non the main idea of this video which has five   steps the first one is total connected load \nsecond one is transformer sizing and third one   is circuit breaker sizing for transformer the main \ndifference between designing of normal building   and high rise building dies in step four and five \nwhich i will discuss later so our fourth step is   circuit breaker sizing for main meter panel \nand load whereas our fifth and last step is   single line diagram focusing on first step which \nis calculation of total connected load of the   building which is equals to common load plus \nflat load common load of building has different   varieties of load except flat load that is \nlift bore well pump water pump and lighting   in our case we are using three lifts each of 10 \nhp two borewell pumps each of five hp four water   pumps each of five hp and 20 kilowatt of total \nlighting load for parking lobby and staircase area   in order to convert this load which is in hp 2 \nkilowatt we need to multiply it with value 0.746   so in our case we are using 3 lifts each of 10 \nhp so 10 into 0.746 into 3 gives us a value of   lift load in kilowatt so 10 into 0.746 into 3 \nis equals to 22.38 kilowatt whereas for borewell   pump we know that we are using two pumps each \nof 5 hp to 5 into 0.746 into 2 gives us a value   7.46 kilowatt similarly for water pump we get \nvalue as 14.92 kilowatt and we know that the   total value of lighting is 20 kilowatt this \ngives us a total common load of 64.76 kilowatt   now we are required to calculate flat \nload in order to get total connected load   let us suppose we have four two bsk flats on each \nfloor which is in total 40 flats on 10 floors   similarly 3 3 bhk flats on each floor \nwhich is in total 30 flats on 10 floors and 3 4 bhk on each floor which is \nalso 30 flats on 10 floors respectively   after this we have to calculate total load of each \nflat for 2b hk flat we use 5 kilowatt energy meter   as i told you earlier so 5 kilowatt energy meter \nmultiplied by number of flats on floor which is 4   and number of floors which is 10 so 5 into \n4 into 10 give us the value of 200 kilowatt   similarly for 3 vhk as i told you earlier \nwe use 7.5 kilowatt energy meter so 7.5 into   number of flats which is three into number of \nfloors which is 10 give us a value 225 kilowatt   and lastly for four bhk flats we use 10 kilowatt \nenergy meter so 10 kilowatt into number of flats   which is 3 and number of floors which is 10 \ngive us a value of 300 kilowatt so the total   connected load is equals to common load plus \nflat load so our common load value is 64.76   so 64.76 is our common load value plus we have to \nadd the 2 bhk 3 bhk and 4 bhq load which is 200   225 and 300 this gives us a value of 790 kilowatt \nwhich is total common load of this building   so the first step is done now we have to move \nto the second step before jumping into second   step we need to calculate peak demand in order to \ncalculate peak demand we need to consider demand   factor which is given by peak demand divided \nby total connected load so according to indian   standards our demand factor is sixty percent \nfor residential and eighty to ninety percent for   commercial and for industry our demand factor is \nninety percent whereas in golf the demand factor   is ninety percent for residential and commercial \nand for industry is 125 so here we are considering   demand factor as 70 substituting the values of \ndemand factor and total connected load which is   790 so we get the value of peak demand as 0.7 \ninto 790 that give us a value of 553 kilowatt   now moving on to second step which is transformer \nsizing we know that peak demand is equals to 553   kilowatt the formula for kva is equals to kilowatt \ndivided by power factor so substituting the values   553 and 0.8 as power factor we get the value \nof 691.25 kva that's equals to 692 kva so   uh here is the standard sizes of the transformer \nyou can see here so as you see here i consider 800   kva transformer for our building so this one is \nrecommended so the third step is circuit breaker   sizing of the transformer so in order to calculate \nthis we need to consider it multiplying factor   kilowatt to ampere and kva two ampere so in order \nto convert kva to ampere we have to multiply by   1.4 to kilowatt ampere we need to multiply by 1.9 \nand for hp 2 ampere we need to multiply by 1.5   so 800 into 1.4 give us the value of 1120 so \nthe circuit breaker we we are using here is   according to standard sizes is 250 ampere acb is \nrecommended you can watch the video by clicking   on the top right side about ampere conversions \nand we are done with the first second and third   step now we have to jump to the main portion \nof our video which is fourth and fifth step   our last second step is circuit breaker sizing \nfor male meter panel and flats here we have to   make a note that for each panel we can use maximum \nof 30 energy meter we are dividing this building   into four parts in order to get maximum of 30 \nenergy meter in each panel so we are considering   here four panels which is cellar one seller \nto ground floor and first floor for panel one   two three four four panel two five six seven four \npanel three and eight nine ten for panel four   in order to select the panel one mcb or circuit \nbreaker we need to calculate its total load first   so panel one has one floor and common load which \nis first floor and common rod which has ten flats   in first floor so that is two bhk four flats three \nbhk three flats and four bhk three flats as i have   shown you earlier for two bhk we use five kilowatt \nenergy meter so four into five kilowatt which   gives us a value 20 kilowatt similarly for 3bhk \n7.5 kilowatt energy meter so 3 into 7.5 and for 4   bhk 10 kilowatt energy meter 3 into 10 which is 30 \nkilowatt so our common load here is 60 kilowatt as   we have calculated earlier so the total value we \nget is 137.5 kilowatt of panel one load after this   we need to consider demand factor which is 70 so \ntotal connected load is equal to 138 into 0.7 that   gives us a value of 97 kilowatt so converting this \n97 kilowatt to ampere we get a value of circuit   breaker ampere has 185 and the circuit breaker we \nare using here is 250 ampere triple pole mccb for   panel one additionally we need to select circuit \nbreakers for panel two three and four in order to   do this we need to calculate loads so each floor \nhas ten flats which means ten energy meters so   three floors means 30 energy meters on each panel \nso on each floor we have four flats right two bhk   four three bhk three and four bhk three so for \ntwo bhk we know that we are using three four flats   so four into energy meter which is five kilowatt \ninto number of floors which is three similarly for   three bhk we know that we are using three flats \nand seven point five into three which is floor   and for four bhk we know that we are using \nthree flats 10 kilowatt energy meter for   three floats thus calculating the value \nof two bhk we get a value 60 kilowatt   load of three bhk 67.5 for three floors and load \nof four bhk for three floors is 90 kilowatt thus   the total connected load for three forces to 17.5 \nkilowatt considering the manufacture which is 70   total connected load is equal to 218 kilowatt \ninto 0.7 that gives us a value of 152.6 kilowatt   converting this to ampere we know that 1.9 is the \nmultiplication factor for kilowatt to ampere so   153 into 1.9 ampere is equals to 290.7 which is \n291 ampere so selecting here a circuit breaker   according to the standard sizes so our ampere is \n291 jumping to the standard size chart we know we   can see here the recombinant size is 400 ampere \nmccb so i'm selecting here 400 ampere mccb triple   pole for panel 2. since the load is same for \npanel 3 and 4 we are using 400 ampere mccb triple   pole for panel 3 and 4 2. thus we have calculated \nthe circuit breaker sizing for 1 2 3 and 4 panel   which is 400 ampere mccb for panel 2 3 and 4 \nwhereas for panel 1 we are using 250 ampere   so each floor we are having 30 energy meter \non panel 2 we have 30 energy meter panel   3 we have 30 energy meter each floor has 10 \nenergy meters similarly panel 4 has 300 meter   and panel one has 10 energy meter for first \nfloor and one energy meter for common node   which is in total 11 energy meter thus we \nare done with the circuit breaker sizing of   each panel now we have to calculate circuit \nbreaker sizing of each load for two bhk three   bits can four bhk flats so for two bhk we have to \nconsider the safety factor which is two so five   kilowatt which is energy meter into 1.9 which is \nconversion multiplying factor into safety factor   which gives us a value of 19 ampere so 5 40 ampere \nfour pole mccb is selected and the same story is   for three bhk which is seven point five energy \nmeter into one point nine into two therefore 50   ampere 4 pole mcb is recommended similarly for \n4 bhk 10 kilowatt energy meter into 1.9 into 2   is equal to 38 so 63 ampere mcb is recommended for \nthis the common load for this is as we know that   65 kilowatt 65 into 1.9 into two into 0.7 which \nis uh zero demand factor so this we get a value of   173 kilowatt for common load therefore 200 ampere \nmccb triple pole is recommended for common load   so we have calculated the load and circuit breaker \nfor two bhk three psk for bhq and common load   individually and now we have to move to the \nlast step which is single line diagram we are   done with first second third and fourth step now \nit's time for fifth and final step of our video   overall going through revision we calculated \ncommon load before lift verbal pump and various   load and got the value as 64.76 kilowatt and \nalso we calculated flat load for each floor   and the total connected load we caught at 790 \nkilowatt after that we did a transformer sizing   using the formula kv is equals to kilowatt \nby power factor we considered a big demand   here so our transformer was 800 kb after that \nwe calculated the circuit breaker sizing for   transformer which is 1250 ampere acp for this \ntransformer and you can check the conversion   video here by clicking on the link above here \nand therefore after that we have calculated the   circuit breaker and loads for each panel \nhere you can see we got 250 ampere for   panel one and 400 ampere for panel two similarly \nfor panel three and four and also we calculated   circuit breaker sizing for each load for two \nbhq three psk for bhk and common load thus we   are done with all the four steps here now moving \nto the final and most important step of our video in this we are using a 11kvy 440 transformer which \nis a dry type as we use dry type transformer for   indoor this is 800 kva transformer as we have \ncalculated the value earlier so 800 kva dry   type indoor transformer on the snd so here we \ni am drawing the four lines which is ryb and n after placing transformer here i am \nusing a 1250 ampere acb which is triple   pole as we have calculated earlier so \nthis is 1250 ampere triple pole acb now i'm drawing main lt panel for panel one two \nthree and four panel one is for common load and   first floor so we are using here \n250 ampere mccb triple pole and for   panel two three and four i am using 400 ampere \nmccb triple pole as i have calculated earlier   so this is the main ld panel \nwhich is 4 mccb for four panels   after this i am drawing a layout for each panel \nwhich is this is meter panel one so for meter   panel one we are using 250 ampere triple pole mccb \nas we have calculated earlier so this is the main   mccb for meter panel one after that this is the \nenergy meter we are using in the meter panel one   this energy meter is for 2b hk so for 2 bhk we are \nusing mcb of 40 ampere 4 pole and the energy meter   is of 5 kilowatt so 2b hk these are four numbers \nso i am placing i am not placing here four numbers   because of the less space you can consider four \nbranches here so similarly three bhk three numbers   and the circuit breaker we are using for \nthree bhk is 50 ampere four pole and for   four bhk we are using three number four bhk and \nthe circuit breaker is 63 ampere four pole mcb   similarly this one is for common load \nwhich is 200 ampere mccb triple pole   thus here we are using four flats into one which \nis the number of floor three flats into one which   is the number of floor plus three flats into one \nplus common load so this is how we calculate the   total energy meter so 4 plus 3 plus 3 plus 1 give \nus the value of energy meter as 11 so we are using   11 energy meters on the meter panel 1 maximum we \ncan use this 30 energy meter in a single panel   now moving on to meter panel 2 we \nare using 400 ampere triple pole mccb   for meter panel 2 this is the branch for 2 \nbhk we are using 12 2 bhk four on each floor   so total two well on three floors \nso two bhk 12 numbers each floor   you can see we have four two bhk flats so \nfor three floors we have twelve two bhk flats so 40 ampere four pole mcb is for these two bhk \nand energy meter is five kilowatt similarly for   three bhk we are having nine numbers three \non each floor so three three equals to nine   so 50 ampere full for mccb 7.5 kilowatt energy \nmeter for four bhk similarly nine numbers   and 63 ampere four pole mccb \nso this is the meter panel two   for our project thus we can calculate \nthe energy meter as four flats into three   floor plus three flats into three floor plus three \nflats into three floor so 12 plus nine plus nine   is equals to 30 flats so 30 flats we are using 30 \nenergy meters in meter panel too which is maximum   we can use in each panel thus you can make a note \nthat for every panel we have to use maximum of 30   energy meter this is the main difference uh in \nthe designing of high-rise building so for two   three four we are using the meter panel two and \nfour five six seven this is the meter panel three   and this is the panel four for eight nine \nand ten floors now to make a revision we   are using 800 kva transformer then a main \nlt panel after that we are using a meter   panel one for first floor and common load then \nmeter panel two for floor two three and four   then meter panel three for floors five six and \nseven and meter panel four four eight nine and ten thus we are using different energy meters \nfor meter panel one two three and four   for meter panel one we are using eleven and for \n2 3 and 4 we are using 30 energy meters in total with this i am done with designing of high \nrise building hope you people have found   this video very useful and don't forget to \nlike this video to appreciate my hard work   and subscribe to my channel electrical infinity \nthanks for watching this video guys take care here i through the am and battles happen everywhere"

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"VideoID": "657",

"Title": "How to read Electrical Blueprints!",

"URL": "https://www.youtube.com/watch?v=Q1XAtVXxH0w",

"Keyword": "Commercial electrical construction",

"Transcript": "hey what's up guys this is john spear warhammer today i'm going to be showing you guys the basics of print reading this is going to be on my new series um how to be a proper foreman all right so first thing on our list is going to be the first page of the e sheets i didn't mention this before this is designed for electrical foremans or anyone who wants to learn the plan set and how to read it how to look at it and a plan for the future so today we are going to be looking at the first page which is e 0 0 1 in this particular case and just go over the basics so symbol legend let's see this is going to tell you exactly what it is on this so let's just do a quick example um right here so these little guys are switches with the d and if we go back up to see what that is just for this particular example we are looking at a switch with the d which is a dimmer switch that's flush mounted up to 44 inches unless otherwise indicated so what that is saying in a nutshell is that you need to get a dimmer switch and it needs to be flush mounted up to 44 inches um and it's going to stay up to 44 inches unless it is specifically noted on the plans that it needs to be a different height so that is what that means in a nutshell and it'll go all the way down this is a single pole occupancy sensor they make three ways so it's good to know this is a three-way wall switch three-way wall dimmer you know so this kind of breaks it up so you can see occupancy sensor thermal overload switch a quad receptacle a regular receptacle once again 18 inches is going to be the typical height unless it is specifically noted somewhere on the plans that it needs to be a different height floor mounted duplex receptacle data com recessed lighting surface mount all that good stuff so you can go down this entire list and you'll see something and if you have any questions you can always refer back to this first page the engineer or whoever drew the plans should have put everything that you're going to need to find on that particular list next thing we're going to go through is the electrical specifications so the list of electrical specifications are basically the do's and do-nots of your project um this is project based so what that means is you know these are going to be different on literally every single project some are big some are tiny some are right in the middle this is to in my opinion i had kind of a small one so you know just looking at it real quick all wire and shell being rigid conduit intermediate conduit or electrical meta metallic tubing emt so it i was planning my stuff out and i on this particular job i would do emt um no aluminum conduit shall be allowed unless specifically indicated on the drawings which it's not so you know anything below grade has to be a minimum size of one inch um all your emt couplings connectors shall be compression tight so that means that there's no set screws allowed um all this stuff is good to know so let's see all conductors should be copper number 12 is the minimum size you know and it's 60 to 100 feet has to be tens it's over 100 feet it has to be number eight so they're basically just auto telling you what to do the use of mc is not permitted good information no everything has to be in pipe all disconnects shall be heavy duty all good information please get into more specific parts of the plan so it's going to be demolition general notes you know so that'll go over all your during the demo and then the projects general notes so each one has a specific reason um it's good to read the entire thing before you even move on to the next stage so now we move on to the picture schedule this is going to be your list of pictures that you get it's up to the project manager to get the correct stuff and if it's not perspective then you need to make those mental notes in your head that this isn't spec these aren't the right part numbers this is going to be the right stuff but the pm should get you exactly what you need in a spec book which we'll go over in a later video but um that is what that is for over here on your right hand side we're looking at you know just basic information so this is going to be the architect the person who drew it the project name and location the date that it was done on if there was any revisions to this set of plans and usually the date associated with that who is drawn by a brief description of what this page is going to tell you about and the page number so if we go down to this one this is the demo plan the floor plan that's demo special systems demo one line demo the new lighting lighting usually circuited so it'll tell you the specific way that i want to be circuited this is a home run so in this particular case you're going to go to panel h a and the second circuit breaker okay this one's gonna go to panel lb circuit breaker four panel lb circuit breaker two so on and so forth do you notice this little guy right here is going to be an oval that usually indicates a key note on the plans so here is your keynote keynote three install a six inch led downward light type c please refer to the picture schedule for details so that's usually what that means in general notes are referring to the general note for this specific sheet okay so keynotes are the ovals for this specific sheet these are going to be your grid lines so gridline e f g one two three four so you can mark a measure if there's no walls or stuff like that all right let's go through this let's see i'm gonna try to find this is gonna be your power page so it's gonna show your receptacles your disconnects panels things like that lighting plans for whatever reason will show the electrical room but they will not really show the panels you can usually find that on the powersheet so this particular ones right here my transformers right here ct right here um you know this is a very typical way to draw an rtu or aka a rooftop unit number nine um so on this particular one it's kind of funky to read but it's a perfect example so this one right here you can always verify but circuit la-12 is going to be a rooftop receptacle which it's kind of a mistake because it should be a goca but it is indicating that it is a normal receptacle so that'll be an rfi which is a request for information which i'll go over in a later series this is going to tell you that it goes to hp 1416-18 it's three-phase rtu but usually rtus are dotted out to show that they are on the roof same thing with this one same thing with that receptacle so it's good to know that you know you can have an rfi press for information on that type of item um these are gonna be your data sheets or your special systems special systems include fire alarm which sometimes they have their own plan sometimes they don't fire alarm data nurse call door openers special floor boxes right here um grounding details usually in it rooms um things like that it's gonna be your electrical details page it's gonna show you basically the very you know sometimes there'll be like a whole room marked out that you can refer to these are very minimal this can be your one line this is a very important page one size in your feeders and things like that you can see now we have a circle and an oval so circles in new mexico anyway usually indicate that it's part of a feeder schedule ovals mean that keep no so once again general notes referred to the entire sheet your schedules refer to circles you look right there keynotes are ovals so let's just take a look for example usually ends mean new ex means existing you know just fyi so these in parentheses means it's a new run we're gonna look at feeder schedule one be your schedule number one install three parallel four inch conduits with four six hundred copper cu it could be al which means aluminum and one three odd ground so you can basically see from point a to point b on the schematic what this is um here's usually your grounding detail of all the stuff that you need to have grounded throughout the system this thing's telling you needs to go to building steel needs to go to slab cold water two ground rods driven since we live in a desert we need two um panel boards main bonding jumpers x y z you know this is your grounding detail this is your grounding electrode what you can need to use what size of wire you're going to need to do what um one thing i didn't mention but i'll go over real quick is you're going to need a scale in the near future it's going to be a new tool each plan has a scale level which is going to be 1 8 so for every 1 8 inch on your scale is going to equal one foot so if we were to look at this and this was 1 8 right here you know this is one two three four four feet over here to the corner so that being said just fyi i forgot to mention that and i apologize so now we move on to pound schedules now schedules are going to be for the specific panels um let's see let's just go through real quick the name of the panel what room it in any drawing references which there was none the service which is going to be your voltage and your wiring configuration so in this case it's a 4277 system that's three phase four wire it's a 1200 amp you know it has main breaker and so there's two different types there's a main breaker our main circuit breaker mcb or mlb or mlo which is main lug only the aic rating what is it going to be so in this case it's surface mounted even one which means it's indoor and it's 42 poles so nema the nema reading means nemo one is indoor nema 3r is outdoor even before is you know extreme location um you know it means a stainless steel which could be in a kitchen it could be in a wet location that has you know vapors something crazy you know um all right so that's just kind of what it is here's an example of main lug only any accessories it comes with so that's gonna be a neutral bar or a ground bar [Music] um let's see and that's basically going to be the nutshell of quick crash course on plan reading for new foreman or anyone who wants to learn so i hope you guys enjoyed this little video once again my name is john speer i'm with warhammer electric um i'm just doing my best to ready the new and up-and-coming group of electricians um i do my best i love doing these videos they are my absolute favorite you know so if you guys get a chance please like and subscribe check me out i'm going to be doing an entire series on how to be a foreman um computer stuff regular stuff how to be a leader things like that once again my name is john speer warhammer electric you can check us out on youtube facebook instagram tick tock even we're on everything so give us a like give us some love if you love the video tell me about it if you hate the video please tell me about it i'm trying to learn myself how to make better videos for you guys so until next time you know i appreciate your time have a good day"

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{

"VideoID": "660",

"Title": "Commercial Electrical Jobs - Here for a job walk #electricalcontractor #electrician",

"URL": "https://www.youtube.com/watch?v=p3cWGAZHMNY",

"Keyword": "Commercial electrical construction",

"Transcript": "back again West Hollywood our apartment project it keeps on going we're just roughing this sucker in as fast as we can a lot of problems still on this job got an issue in the Elevator Shaft something going on there they called me up told me to come down right away to solve it commercial electric are you guys into it hey are you subscribed to the channel so I want to teach you how I got into these jobs and everything else for you to become the best electrical contractor you can be subscribe and we will see you inside that building and on the next one"

},

{

"VideoID": "661",

"Title": "Commercial electrical work at Saphora with Instagram&#39;s @electric.anna",

"URL": "https://www.youtube.com/watch?v=S3GRPWzFndk",

"Keyword": "Commercial electrical construction",

"Transcript": "what's up 360 electricians here with the A Team Anna Joseph in Sephora in Kohl's putting up these incredible lights pretty intricate you when to do jobs like this you're going to have to check your parts and material we found out that these little brackets right here were missing so now Anna's putting them in over here you having fun so the first thing we noticed was we were using a Phillips on the screw bits check your screw tips to make sure this ended up being a torque bit uh so once we figured that out made it super easy so stay tuned and we'll talk more about the Sephora job what i b it for and how we got it we'll see you on the next one"

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{

"VideoID": "662",

"Title": "Hire The Right Electrical Contractor For A Commercial Construction Project",

"URL": "https://www.youtube.com/watch?v=DFUx9ftlNcg",

"Keyword": "Commercial electrical construction",

"Transcript": "selecting Dane electric will give you peace of mind that all your commercial or industrial electrical and Telecommunications projects will be done right done on time and done on budget to learn how we can help you call or click Dan electric today"

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{

"VideoID": "667",

"Title": "DCTS Electrical Construction &amp; Maintenance",

"URL": "https://www.youtube.com/watch?v=flEBYIvaafo",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] Bothwell kicked off the counter tactical my name is Tonya and I'm a student enrolled in the building construction program I can't wait to show you around hello everyone and welcome to electrical construction maintenance have you ever thought about being an electrician well if you have this is the place for you if you are curious what electricians do electricians can wire anything from residential homes to commercial buildings such as school stores warehouses and so much more the first type of electrical wiring that we do here in electrical construction maintenance is called commercial wiring commercial wiring is any public place that you see residential wiring is anywhere you can utilize power in your home here in electrical construction maintenance we have many opportunities whether you want to go to post-secondary education or whether you just want to go right into the workforce now how amazing is that this is electrical construction maintenance spark up your direction [Music]"

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{

"VideoID": "668",

"Title": "#Ready4Wire #sparky #power #construction #work #electrical #new #commercial #conduit #electrican",

"URL": "https://www.youtube.com/watch?v=BFi9HbcJuZ0",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] as I walk through the valley of the shadow of death I"

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{

"VideoID": "669",

"Title": "Prefab Is A Game-Changer For Electrical Construction #shorts",

"URL": "https://www.youtube.com/watch?v=PQ25qdlH2uo",

"Keyword": "Commercial electrical construction",

"Transcript": "nothing has changed the electrical industry in recent years more than prefabrication prefab increases job speed and accuracy by building essential electrical construction components off-site for efficient and cost-effective installations on the job site we are here at one of our signatory electrical contractors Continental electric prefab allows them to properly measure and account for all materials so that when they get to the job site the contractor has everything that they need so just how does Continental know how to build things exactly to spec using computer generated Graphics called Bim or building information modeling to make sure that they are sending out the exact specifications for the client which can at times dramatically reduce the time it takes to do a job from two to three weeks to just one to two days because of that Bim modeling capability that's really pushing the envelope now and there's really no end to what we can or can't do"

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{

"VideoID": "671",

"Title": "Commercial Electrical Project - Southern California Camp Job Update. #shorts #electrician",

"URL": "https://www.youtube.com/watch?v=nk51u0bkXBY",

"Keyword": "Commercial electrical construction",

"Transcript": "hey 360 electricians up at frasier park at the christian camp you've seen the videos from almost a year ago i'm up here doing a job walk finalizing everything let's go inside and take a quick look if you remember this room is where we kept all our material and we still do all of our precious square d breakers definitely pick yourself up a cart makes everything easy on a new construction site all right and as you can see everything is almost finished except i want that panel to look like that short that i did where you make your boss happy right that's coming we got another panel down here plans didn't show a lot of egress exit lights so we put them in just a quick update hope you guys are doing well uh look if you want to get into commercial hit me up on coaching uh it's the best way to go this project's been going on for almost a year but it's what i call a whale job it's a job that gets you by uh seasonal even when it's slow you still have work god bless you guys we'll see you on the next one"

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{

"VideoID": "673",

"Title": "Commercial Electrical Contractor",

"URL": "https://www.youtube.com/watch?v=At\_1jHW-tnU",

"Keyword": "Commercial electrical construction",

"Transcript": "a safe and efficient electrical system is one of the most important aspects of your home we depend on electricity for light and heating we depend on it for cooking and washing and so much more electricity is an integral part of our lives and when something goes wrong it's not just inconvenient it can also be dangerous so regular maintenance is essential and only a licensed qualified and full insured electrical technician should be used whether your home needs electrical repairs or routine inspection or you're buying a new home that needs inspecting you need an electrician you can trust to get the job done safely and at a reasonable cost that's where we come in and you can depend on us contact us today [Music] a safe and efficient electrical system is one of the most important aspects of your home we depend on electricity for light and heating we depend on it for cooking and washing and so much more electricity is an integral part of our lives and when something goes wrong it's not just inconvenient it can also be dangerous so regular maintenance is essential and only a licensed qualified and full insured electrical technician should be used whether your home needs electrical repairs or routine inspection a safe and efficient electrical system is one of the most important aspects of your home we depend on electricity for light and heating we depend on it for cooking and washing and so much more electricity is an integral part of our lives and when something goes wrong it's not just inconvenient it can also be dangerous so regular maintenance is essential and only a licensed qualified and full insured electrical technician should be used whether your home needs electrical repairs or routine inspection or you're buying a new home that means inspecting you need an electrician you can trust to get the job done safely and at a reasonable cost that's where we come in and you can depend on us contact us today or you're buying a new home that means inspecting you need an electrician you can trust to get the job done safely and at a reasonable cost that's where we come in and you can depend on us contact us today you"

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"VideoID": "674",

"Title": "Elk Electric | Electrical Construction, Technology, Low Voltage, Service &amp; Maintenance | Austin, TX",

"URL": "https://www.youtube.com/watch?v=niE4SfUoKK0",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] at ELQ electric we pride ourselves on many things but perhaps the most important thing is your satisfaction a licensed insured and bonded company we hire the absolute best trained certified personnel and offer the most competitive rates whether your needs are residential commercial or industrial we provide a host of services like troubleshooting and diagnostic services to electrical service upgrades pole lighting maintenance thermal imaging lighting design installation and maintenance as well as security or access control we'll even design an electrical preventative maintenance plan keeping your electrical system running efficiently and we keep your business safe with 24/7 monitoring of electrical fire and security issues since 1961 we've proudly been serving clients in Texas and throughout the world and we can't wait to work for you call ELQ Electric today at five one two four four two eight zero eight five or visit us online at ELQ electric calm [Music]"

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{

"VideoID": "675",

"Title": "Main Power Disconnects Outside? Seems like a Thieves Dream! #electrical #construction #realestate",

"URL": "https://www.youtube.com/watch?v=ROJSWx\_6hhY",

"Keyword": "Commercial electrical construction",

"Transcript": "hey is everybody enforcing this code to have disconnects on the outside of your h house so anybody can shut your power off let me know in the comments if this is something that's going on in your area because I think it's absolutely insane I understand firefighters need to turn off the uh Power if the house is on fire or whatever but most of the time they just pull the meters tell me what you think"

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{

"VideoID": "676",

"Title": "Commercial Electrical Services Atlanta GA",

"URL": "https://www.youtube.com/watch?v=6j9EhUrAej4",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] are you looking for a licensed experienced and reliable electrician finding the right electrician for your needs can be a challenge only trust experienced electricians we have years of experience in providing emergency and commercial electrical work with a quick response to your call we always do professional and affordable work guaranteed to keep you safe and protected we get the job done with the highest quality from qualified professionals we pride ourselves on customer service our expertise is your peace of mind for a job well done you can't go wrong when you hire us call us for all your electrical needs today you [Music]"

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{

"VideoID": "677",

"Title": "Avoid Costly Mistakes: Tips and Tricks for Commercial Electrical Projects from The 360 Electrician",

"URL": "https://www.youtube.com/watch?v=ij-I1R\_Ta-k",

"Keyword": "Commercial electrical construction",

"Transcript": "Back again with Rudy in the LA office. Today we're gonna go to West Hollywood. We're gonna go see our eight unit luxury apartment complex. We've got some issues going on there. Rudy's gonna walk me through the job, gonna try to solve it and uh, maybe some other things. So join us as we go to West Hollywood. Well stopped at windshields cuz Rudy doesn't go anywhere unless I feed 'em first. Every single video we're stopping eating something. All right? A few months ago I did a video that said our new project and I went like this over and that thing was a big ditch but we're here now. Looks like they are parking lot garage is done. First floor is done, second floor is done. Third floor is done. We still have fourth floor still coming in. Let's go check out progress. I have not been to my job site. This is my job site for my company. I sold it eight months ago. I've only been to this job site twice. Guys, I'm not saying that till like pat myself on the shoulder. I'm saying that because you can run your business from 1200 miles away if you know what you're doing. You have the right system and you've got the right guys. But let's go take a look. The one time, the one time I get to wear my Klein carbon fiber hard hat, I don't bring it. I might have to borrow one from the guys. One major issue we had here at this job is that the building owners pulled the permits but it took the city three years to get the permits. Well it's so happens here that Southern California Edison whose pole we're gonna be using when you apply for the building, their permit or their reservation lasts two years. Their permit here to have the utilities that they need expired a year before they started construction. What a nightmare for us. We had to completely rechange everything around and get this job done for this client. But it took a lot of time and effort and you need to charge for that. So one of the big changes from the utility was before they were supposed to go underground, pipe it underneath the parking lot and come up from an underground feed to our 800 amp switch gear Because of that mess up. This pole was actually behind me on the plans and it was nowhere in sight. So when I did my initial site visit, I recognized that. So now they're making us put two surface mount pull boxes and then we're gonna pipe down again an additional seven or $8,000 that the owner didn't have to do. If they had hired us earlier, we would've known that the permit was gonna expire from the utilities. They wouldn't have this problem. I know all you union guys are freaking out right now because we don't have our hard hats on. We know it, trust me. Unfortunately, mine's 1200 miles away in Montana and Rudy didn't bring me an extra one cuz maybe he doesn't want his paycheck this week. I don't know. Alright, so big problem that we have is with the owners, it's a little hard to communicate back and forth because they're dealing with their engineer. Our electrical plans are mismatched with some of the architectural plans. So now you know West Hollywood, big problem. You better follow the rules. We got everything on our architectural is calling for ADA compliant. Well disabilities act, right? American Disabilities Act changes the box locations and everything. That's what we're discussing right now. So, Okay, so they just gave me some information. Super important, when you're doing commercial, if you don't have the right guys that know what they're doing, that's my guys right here. Let me take a look. Before they pour the deck, most of our conduits come into this section right here. Afterwards, they put in these stairs and they realized they messed up and they didn't put a wall to support these stairs. The problem is they needed to drill into the deck to get their rebar. We're afraid that they tapped in or they drilled into our conduit. Then we have to mandrill the whole thing. That technically is a chain order. It's gonna take a lot of time and effort or we'll just go ahead and do it and pull the full string and try not to charge it. Super important. Your guys know what's going on. They caught it. They let the architect know that they said they had no choice. They had to support it somehow. Be careful when you're doing commercial, it could get messy, but if you charge for it, then who cares, right? it's not our problem. The problem is having your client pay it. That's the problem cuz they're never gonna admit that it's their fault and none of the other trades are. So you gotta document everything. You gotta write it down. You gotta take pictures. That's the lesson learned. All right? That takes care of it for us here in West Hollywood. If you got something outta this video, hit subscribe and we will see you on the next one."

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"VideoID": "678",

"Title": "Best Commercial Electrical Contractor Ocotillo AZ",

"URL": "https://www.youtube.com/watch?v=VqynVyvKwnk",

"Keyword": "Commercial electrical construction",

"Transcript": "looking for the best commercial electrical contractor in ocotillo Arizona for new construction reliable electric maintenance on your commercial buildings or interior exterior lighting jobs finding the right electrical contractor can be a complicated process and no one can afford to make a mistake when your career and your reputation are on the line work with the big national companies you're just a number no personal accountability work with the little guys and they may not have the right people or enough capital to get things done on time and on budget but there is a company that fits perfectly in between a company that gives you guaranteed work and accountability at every step of your project that company is look electric in ocotillo speed and guaranteed reliability or vital that look we know we have to earn your repeat business and that's our goal from our very first conversation to earn your business every day to be reliable and consistent with the little details that most companies miss that means our men show up on time we get your work done on budget we only used experienced polite crews who speak English we guarantee our work fully licensed bonded and insured and we can be available 24/7 if that's what your project needs plus you get something extra wood-look electric what's that plus factor it's our ability to understand your whole job to make it run smoother because we see it like a general contractor the truth is that for 25 years key people in our company or general contractors here in Arizona working on multi-million dollar residential and commercial projects a few years ago they decided to focus strictly on electrical contracting but what that does is it gives us the advantage of seeing your whole job in understanding the process we think like a flexible partner to make your life easier this translates into more work done the right way when you need it you've probably seen our work in national retailers like Best Buy Dick's Sporting Goods Marshalls or Walgreens we even did Tesla Motors we work with churches we work with all types of retailers but probably what's most outstanding is we work for companies that have to keep their customers happy the city of Goodyear PMG property management services city property management Arizona's largest locally owned HOA management firm with over 300 communities throughout the state we work with major hotels and resorts on their electrical commercial maintenance like the Arizona Biltmore Arizona Grande that used to be the point at South Mountain the Doubletree and Residence Inn whether it's electrical contracting and oka tio electrical maintenance or lighting projects look electric is the right choice we get our work done on time on budget experience polite crews who speak English guaranteed work you're always working with an owner we're a family owned company fully licensed bonded and insured available on call 24/7 call us today for your free estimate to see how we can make your life and your project easier you can reach us at four eight zero seven three nine two two two eight find out about the look electric difference you'll be glad you made the call"

},

{

"VideoID": "679",

"Title": "Granite Ledge Electric - Commercial, Industrial, and Transportation Electrical Installation Experts",

"URL": "https://www.youtube.com/watch?v=Xo7IVcZhMgE",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] I am Jeff Trentham Angela included in business for 18 years my rules I cryed allege are safety technology making sure that we're up to date on cutting-edge electrical systems I'm Rhonda president of granite legend electric I've always been part of a management team so it just seemed like a natural process of stepping into the office management wall but I also am very involved with the things that happen out in the field and kind of working through those whole processes - that's wrong we come way more diverse currently we do transportation industrial commercial and energy we're very involved in our community when I believe that has strengthened our relationships them helped us to grow one of the big things that left from our competition is our desire to stay up with technology in the construction industry technology is always advancing so to keep up on that is very important partnering with Power Partners has given us a huge advantage as far as technology and keeping up with the standards of what is happening out there what power partners were able to hire people specialized in certain areas say whether it's fire alarm security whether that whether it's people with outside work and fiber optics we really focus on hiring the right people for the right projects as we're growing other projects not being involved with all of them and we're able to access the manpower that they have readily available but doesn't limit us to a crew of six people I need a crew of 15 people I do have that available as a member of our partners one thing that I've been extremely impressed with the amount of training not only for myself but for my informant the office health and the camaraderie among the contractors themselves I'm able to go to my peers ask them questions and see how they're dealing with certain situations and if they're not able to answer that our partners have unlimited resources just been a great asset for me [Music]"

},

{

"VideoID": "680",

"Title": "Live Wire Electrical Services | New Construction, Generators, Commercial-Residential | Largo, FL",

"URL": "https://www.youtube.com/watch?v=H84MDxMxhNc",

"Keyword": "Commercial electrical construction",

"Transcript": "established in 2003 live wire electrical services incorporated is a locally owned electrical contracting company that will work with you diligently accurately affordably and above all with unmatched customer service whether you're looking for reliable and affordable electrical experts for your residents or complete commercial and industrial electrical services we can do it enjoy worry-free services when you rely on livewire electrical services incorporated it's our goal to provide you with 100% satisfaction we understand your residential commercial and industrial concerns when choosing an electrical contractor our team always gets to the job on time and is clean and competent live wire electrical services honestly cares about your concerns and needs our highly qualified electrical technicians have the full capability to provide you with the best service whether it's a simple replacement of a circuit breaker or the complete design and installation of an electrical system give us a call today for a free estimate at seven two seven five three one two five zero zero or for more information visit us online at livewire electrical calm [Music]"

},

{

"VideoID": "681",

"Title": "Service call!! #sparky #electric #electrical #construction #trades #fyp #foryou",

"URL": "https://www.youtube.com/watch?v=jkWLyyfFYfM",

"Keyword": "Commercial electrical construction",

"Transcript": "here we go again [Music] [Music]"

},

{

"VideoID": "682",

"Title": "Program Spotlight: Electrical Construction &amp; Maintenance",

"URL": "https://www.youtube.com/watch?v=I3yn0lbx8gs",

"Keyword": "Commercial electrical construction",

"Transcript": "(upbeat music) - [Tutor] Electrical\nConstruction and Maintenance is a program for anyone who enjoys working with their hands. Under the guidance of\na licensed electrician, students will gain the\nknowledge and skills to prepare them to enter the field as an electrical apprentice. While students will learn\nthe theory of electricity, the national electric\ncode and blueprint reading the program is driven\nby hands-on experience. They begin by building outlet boxes, similar to what can be found\nin any residential home. They also learn to install light fixtures and perform troubleshooting\nand diagnostic work. Students get a thorough\nlearning experience in residential, industrial\nand commercial electricity. This extensive program\nwill prepare students either to enter into the\nworkforce as a tradesman in an apprenticeship position or continue on where their\npost-secondary education. (upbeat music)"

},

{

"VideoID": "683",

"Title": "Commercial Electrical Contractors Decatur GA",

"URL": "https://www.youtube.com/watch?v=nkilxx-YR28",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] if you're looking for a reliable professional and affordable electrician well you've come to the right place we're proud to be the top local electrician service and we're committed to creating satisfied customers no matter what type of electrical service or installation you need done we can do it all call our email one of our friendly staff now to set up an appointment [Music]"

},

{

"VideoID": "686",

"Title": "How to Build A Commercial Electrical Gear! Tips &amp; Tricks! #electrician #electrical #construction",

"URL": "https://www.youtube.com/watch?v=009VcmJwMQA",

"Keyword": "Commercial electrical construction",

"Transcript": "foreign thank you foreign [Music] foreign foreign"

},

{

"VideoID": "688",

"Title": "Industrial Electrical Installations | Instrumentation | Commercial Electrical | Lyjon Electrical",

"URL": "https://www.youtube.com/watch?v=SxJijtQklLA",

"Keyword": "Commercial electrical construction",

"Transcript": " Welcome to the Lyjon Group I'd like to introduce you to our\nElectrical and Instrumentation division which was established in 1964. In this time we've built an enviable reputation for quality and safe practices in the industry with\nprestigious clients such as Growhow, Innospec, Sonae, Mexichem and many design houses and commercial clients. We feel our reputation speaks for it's self,\nWe've been working with a number of customers for over thirty-five years\ndemonstrating our commitment to deliver value. Lyjon Electrical provides a full\nspectrum of electrical and instrumentation services covering design, installation, commissioning, testing and technical support. You can rely on Lyjon because we employ our own fully trained personel for total control and accountability. We have invested in ISO\n9001, ISO 14001 and OHSAS 18001. Ours managers are highly experienced professionals with many years experience of industrial\nand commercial projects, from inspception to completion on time\nand in budget. Our mission is to show you how\nwe can achieve your objectives and give you the confidence in our expertise to\ncomplete your project for the highest standards of workmanship. We have over 30 case studies on our website explaining our approach to projects, our\nclients objectives and how we achieve them. Our considerable investment in safety training and expertise means that Lyjon are confident in delivering the highest standards of quality and efficiency to every project large or small. At Lyjon we're extremely proud of our\nachievements so we would welcome the opportunity to discuss how we can be of service your company. "

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{

"VideoID": "689",

"Title": "Commercial Electrical Contractors Doraville GA",

"URL": "https://www.youtube.com/watch?v=MswZFwaHBK8",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] are you looking for a local reliable and affordable electrician do you want to hire an electrician with years of experience and many great customer reviews if so you've come to the right place we are fully licensed and insured and have performed electrical work for hundreds of local clients whether you need electrical panel work subpanel smoke detectors lighting circuits or wiring install that we can do it all contact one of our friendly staff now to get a free no-obligation quote on your electrical work [Music] you"

},

{

"VideoID": "690",

"Title": "Advancing Technology In Commercial Electrical Installation",

"URL": "https://www.youtube.com/watch?v=m90r8JbzKmg",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] having access to a knowledgeable electrician is essential to our everyday life so much so that when the power goes out at home or work everything comes to a halt let's go inside the blueprint my name is mark aslan i'm president and owner of performance electrical contracting in jacksonville florida we are a full-service electrical contractor in the area we service a large variety of multi-family customers as well as commercial and residential custom homes i started doing electrical work when i was 18. kind of liked the idea of working with my hands and working outside and making things work i was working at this one company that closed their doors i helped open up another company that's where my partner donny came in he started as my helper we wired houses together all over northeast florida and then he picked it up pretty quick and he went off and he started putting him on jobs doing his own work and start the job started to get bigger and bigger donnie and i ended up working together at another another company as project managers i mean my goal was to start a business something i wanted to do so i we sat down me and donny sat down and i said i need your help we bring in scott our project manager and he's been a big help he started as a foreman in the field with us and now he's a pm and we're looking to grow and we're looking to bring in people that want to grow and learn to trade i think it's important performance electrical contracting is a full-service electrical contracting company that proudly works in tandem with a wide variety of other trades professionals i worked for mark since 1998 he called me when i was at my old company and needed some help so i came over here to performance electric contracting we're more like a family i've known both owner and co-owner for multiple years i can go to mark or donny with anything and they will help me out with anything any questions i have skilled tradespeople are in high demand it's important to further the trades in our current society some benefits of being in the construction trade are the leadership skills you'll learn to be able to further yourself in the trade and also in other areas of life like right now i'm teaching in the first year nefa program for apprenticeship and so i'm teaching these guys the skills they need to learn to be able to further themselves in the trade going through the apprenticeship program i basically it just sped up the learning process and got me better at my job quicker it just snowballed into running my own jobs and then working with mark we had an idea and i kept pushing him to start his own company and he was the one that actually did it most of our jobs are kind of similar to what's behind me our guys pretty much report to the job and work we communicate with them through their phone and we use technology an app and we are able to update drawings via the office that they can sync their sync to their tablets and also helps us with our field reports and our safety sheets and our hazards identifying you know we can take pictures we can upload them to the the group that's part of the group on the job everybody's collaborating on one app it's a great tool but this is a typical garden style apartment building that we do you know it's exciting to see it come together trust and transparency is very important in these types of industries a great relationship with the customer is a top priority what we try to do with our customers is we try to build a relationship we try to be you know we want to be a team player i think we are a team player and we try to identify problems early on and try to you know resolve them before they become a bigger problem we identify issues that we've seen in the past that you know seem to keep happening on different jobs and we uh we we bring them to the forefront and we try to uh resolve them in a way that where it could be cost effective a lot less cost impact and delays than it would if we waited until further progress of the job relationships are with your customers important it shouldn't be about a number of course budgets important price is important but i think the lowest number is not always the best choice so what does the future hold for performance electrical contracting we are here to help and we are here to you know to solve problems we cover the northeast florida area we are licensed all the way up to north carolina but we generally cover the northeast florida down to gainesville orlando is probably our furthest you know we're always looking for new customers and i think we can provide a competitive quote and we can give you performance when you need"

},

{

"VideoID": "692",

"Title": "Commercial Electrical Contractor Services in Las Vegas NV | McCarran Handyman Services",

"URL": "https://www.youtube.com/watch?v=Zaz\_O0KKKFg",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music]"

},

{

"VideoID": "693",

"Title": "Electricians and Electrical contractors Podcast- Modern Electrician Podcast #electrician #electrical",

"URL": "https://www.youtube.com/watch?v=IWmpdTCuNoY",

"Keyword": "Commercial electrical construction",

"Transcript": "are you an electrician that's never subscribed to a podcast how can that be these days there's some awesome podcasts for electricians and electrical contractors out there in fact we have our podcast at the 360 electrician podcast available at Google Spotify and apple but this week I'm super excited because I've been invited as a guest to no other than the modern electrician podcast Josh and Doug over there great guys go over there and check out their podcast and check me out at the Modern electrician podcast make sure you give them a big the 360 electrician shout out why because"

},

{

"VideoID": "694",

"Title": "Northeast Electrical Construction and Control Program",

"URL": "https://www.youtube.com/watch?v=pB4\_c3mjA8w",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] the electricians program is basically a construction and control type of program we do residential construction commercial industrial background codes we try to work at least two hours of lab with each classroom hour of lecture so we want to get as much hands-on as possible with students so when we're covering something in lecture class and residential wiring or commercial wiring and code we're trying to tie it all together tipping about it at they'd be what they lecture us in class and we get out and we do it in the lab and then that's what I really like about the program you know I like that instructors really help you but then give you the leverage in making letting you choose your own ideas and that's what brought me to this program all three of us instructors have been here so we have some longevity in the program we have a lot of lab stations that we start our residential wiring and single poles freeways four ways we see devices then we use the same lab for conduit bending in the second semester commercial one we do control panels pump panels control wiring panels fire alarm panels we have some grain handling or solid material handling systems that they have to program and make run for different weights and mixes and things like that between the first and second year they will go and work for a licensed contractor as far as practical work experience a student coming into the program wants to have a good background in math maybe some science that would help in the basic electricity portion good hand skills you know dexterity type of things we have a lot of jobs available and the trade looks good so if they're interested in a good field to get into it's the electrical field there's a lot of different areas that they can be employed in whether it's new construction residential commercial industrial we can get them on the road and travel the country see the country it's service work we have lighting heating systems that have to be upgraded so there's a lot of different areas that they can be employed on la razón que esto hizo éste Colegio espartero vivo no a este este tipo de curso de la prensa da y pues es la razón que esto viene Afiya hacer este curso de letras de la casita para para Nahor para una a tener un mejor Tabaco una mejor vida [Music]"

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{

"VideoID": "695",

"Title": "RV Contractors Residential and Commercial Electrical Service A/C Systems",

"URL": "https://www.youtube.com/watch?v=0dr3dPB5BkM",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] welcome to RB contractors a wide range of services we offer you electrical AC residential and Commercial Clean Energy Solutions new constructions remodeling maintainance sa SK Network system Access Control security cameras fire alarm landscape lighting H Entertainment System system H inspections and more you can contact us at this number or you can visit us online at RB contractors.com [Music] [Music]"

},

{

"VideoID": "699",

"Title": "Best Commercial Electrical Contractor Chandler AZ",

"URL": "https://www.youtube.com/watch?v=UNFmbFAAlcA",

"Keyword": "Commercial electrical construction",

"Transcript": "looking for the best commercial electrical contractor in Chandler when you have a project whether it's new construction electrical maintenance interior exterior lighting jobs repairs it can be a complicated process to find the right company things happen fast in Chandler you can't afford to make a mistake when your time your money in your career on the line when you work with the big national companies you're just a number work with the little guys they may not have enough capital or the right people to get things done on time and on budget but there is a company that fits right in between guarantees their work and accountability that company is look electric when you're in a city growing as fast a channeler speed counts that look electric we know we have to earn your business every day we have to earn your repeat business so we pay attention to the little details the details that most companies miss our people are always on time they're on budget we used experience polite crews who speak English we guarantee our work well fully licensed and bonded and can be available 24/7 if need be and we offer something extra something you can't get anyplace else the plus factor what's the plus factor well our key people transition from general contracting to electrical contracting so we see a project differently we see it as a whole and that experience helps us help you solve problems these aren't solutions you can just get from any electrical contractor you probably have seen our work and some of the major retailers we'd work with Best Buy Dick's Sporting Goods Dillard's Marshalls Walgreens Tesla CG our tires and service we've done churches like Christ Church of the valley and we work for a lots of companies who have to keep their customers happy the city of Goodyear city property management Arizona's largest HOA management firm with over 300 communities we work with major hotel chains on maintenance and new construction like the Biltmore Arizona Grande the Doubletree and the Residence Inn at look electric your project will be done right on time on budget with by experience polite crews who speak English we guarantee our work give us a call four eight zero seven three nine two two two eight you'll get a free estimate and see how the plus factor can help make your life and your project run easier [Music]"

},

{

"VideoID": "700",

"Title": "⚡️ #electrician #electrical #construction #sparky #electricianlife #plumber #sparkylife #wiska #wago",

"URL": "https://www.youtube.com/watch?v=1BIaVxmrArk",

"Keyword": "Commercial electrical construction",

"Transcript": "I'm from I [Music] got far away I'm I make a move waves I've beening for a long time I had a vision from [Music] theion I here in little s i just flow I don't need gravity I need when I quick Rumble I will never ever F stumble and I don't need to be humble break [Music] out"

},

{

"VideoID": "701",

"Title": "Michigan Residential Commercial Electrical Emergency Services",

"URL": "https://www.youtube.com/watch?v=KjAp1EhM6J4",

"Keyword": "Commercial electrical construction",

"Transcript": "are you looking for a licensed experienced and reliable electrician it doesn't matter if you are an individual or a business if you have a large or small project finding the right electrician for your needs can be a challenge only trust experienced electricians we have years of experience and take outstanding care of your home or office providing emergency residential and commercial electrical work with a quick response to your [Music] call we always do professional and affordable work guaranteed to keep you safe and [Music] protected we get the job done with the highest quality from qualified professionals we pride ourselves on customer [Music] service our expertise is your peace of mind for a job well done you can't go wrong when you hire us call us for all of your electrical needs today"

},

{

"VideoID": "703",

"Title": "RV Park Construction Commercial Electrical Panels For RV &amp; Campground Investors Expanding Their Park",

"URL": "https://www.youtube.com/watch?v=EP2inIH0xXs",

"Keyword": "Commercial electrical construction",

"Transcript": "okay so now we have what I'm going to show is our electrical setup this was all designed basically by our electrician we didn't have electrical plans we excuse me we just told me here's what we're doing here's the here's the plans for the spaces what do you think so he has a good feel of how much and what kind of panels to put up there how much how much ampage we need where we need it at where we need it located we had to make some adjustments of course um but here's how it looks let's see if I can open this of our May and we have our spaces and we basically pay like per each one of these we have set up those will be installed later this right here um this pole they installed they installed this whole entire thing this right here is where we're going to be pulling electrical so if you look right here there's a much smaller panel over here it's probably gonna have to redo but I think we have the choice between burying the line with the county or coming over the top I think we're going to take it from Over the Top to here I can't I think I'm pretty sure but basically we have to get power if you see the power you can see the power so the power is being pulled right now from the neighbor right here it's hard to see but basically over here and that's what and that's the panels right there that I'm sorry that's the panel that's right there that currently power the current spaces we're gonna have to um pull power over here and basically adjust it in a couple a couple hours of one interesting day but here's kind of how our our electrical panels look I don't know much about electrical all knows that there's distance matters amperage matters um you only have so many per space apparently what this thing is I don't want to break anything so not to open it up but yeah well put together commercial other electrical contractor can can hook you up with something very similar um yeah and so right here they're installing one of the tanks right here a little bit of a delay we're gonna have to see if we can get a pump installed out here as well too um but yeah that's our electrical setup it ends up being like this a little stood up like this and then we'll put um obviously our meter in in uh Etc right here okay hope that was helpful mmm"

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{

"VideoID": "704",

"Title": "What is an electrical contractor? #Journeyman #master #electrician",

"URL": "https://www.youtube.com/watch?v=lNgdYI8nI9Y",

"Keyword": "Commercial electrical construction",

"Transcript": "first and foremost what does an electrical contractor do what does it mean to be an electrical contractor because in the state of California if you get a C10 electrical contractor's license did you know it means everything from zero to 600 volts ac dc or if there's anything else in between okay that means if it's broadcasted through the airwaves through a wire or through microwave or any apparatus if it has voltage from 0 to 600 volts you are licensed to work on it you are licensed you are approved to sign contracts to do business to open your bank account well that has to do with your taxes but still so that is what is about being an electrical contractor it's so that you can actually do the work of electrical"

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{

"VideoID": "708",

"Title": "How to Choose an Electrical Box | Ask This Old House",

"URL": "https://www.youtube.com/watch?v=Nn13DMnKoBw",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] hey heath hey kevin how are you all right looks like you got the letters about folks not knowing what to buy in the electrical aisle it's a confusing aisle sometimes right you think you know what you need you go down there and all of a sudden all these options and then you realize you have no idea what you need hey guys boxes so what do we do uh let's start with the easiest and the most common new work new work okay and when you say new work not new work that you're doing that saturday you're talking about not a new job but the type of construction so new construction open frame okay so for something like that in a residence we typically use newark plastic boxes like these and the advantage of these is they're fairly quick we can nail them right onto a stud wire them quickly and then cover them up with the drywall and they come with a little nailing flange and oftentimes the nail's embedded exactly and you've got enough room to bang that in and so they go they set themselves a little tab to set the spacing and look what you get and that's the finish and they're usually always plastic not always plastic we tend to use plastic more often than not when we're doing new construction sometimes you do run into metal and that is an option as well uh depends on the type of cable you have so if we're using non-metallic cable with a with a plastic box we'll try to do the plastic if we run into metal clad cable we want to use a metal box gotcha and what is it about the metal boxes that we like for the metal box this is actually designed with a clamp to hold that metal clad cable it also accepts a ground screw and that lets you ground and bond everything together we want to make sure that metal box is grounded correct and this is new work as well so you presume that you've got enough room to screw through it into the stud exactly so if that's new work this is old work this is old work so we've got an existing wall and we're either going back into a hole where a box was or we've got a pl popping or we're looking to add something all right how do we make sense of these all right this is one of our more common boxes that we'd use for old work it's a single gang plastic old work what you would do is you'd mark the outside of this box cut the drywall slide it into place and then you'd actually tighten those screws and draw that clamp forward to hold it in it's got a little bit of a flange there look at you with the spinny display here something like that grab right there and there is no stud that you're going into so you could pretty much put this anywhere right in the middle of a bay is fine if it will hold all right what's the difference between say this guy and this one here so this one you can use on new drywall as well but this also helps if you have an older home with plaster and lath if you can find the stud and cover it up against it you can actually slide this in and screw it from the face yeah look at that so it's got a screw at an angle coming out that side and the idea is that you can access it from the front go through and drive that into the stud and secure the box right to the stud acting like new work but it's actually old work very clever so these you call them single gang this is a single gang and then from there we go to double gangs something like a two gang you can go to a three gang of four gang it depends on your application how many switches you're looking to put in right and these two for example basically same idea there's tabs just twice the space exactly just a different size different application square or rectangle um and then the round guys we typically use these for lights so bathroom scones sconce in a hallway or living room that's when we use something like this same idea cut a hole slide that in tighten the screws it would draw back just like one of these and if we were going above head into the ceiling different choices there different choices there in that case i actually prefer to use metal even with the non-metallic cable i'd like to put something like this a fan rated box that'll kind of future proof things if they want to put a ceiling fan or a heavy light fixture and we'll mount this to the structure so a fan rated box can carry more weight and so you're going to go even if you're putting in an overhead light that's not heavy you're going to do a fan rated box just sort of the future just to cover ourselves yeah okay and that would just go right into the structure exactly but of course no one's ever put structure in the center of the room where i need to put my that never happens ever so in that case what do we do so in that case that's when we come to this which we've seen you install before right same kind of box but we'd cut that hole slide the brace in spin it until the two ends tighten up against the structure once that's tight you can attach the box and then you can still carry the weight of a heavy fixture or a fan literally expands into that gap and locks into the flanking right and then you can move that left or right exactly okay i think i get it um next time i'm in the aisle just make sure you got your phone on sounds good because i'll give you a call thank you heath thanks thanks for watching this whole house has got a video for just about every home improvement project so be sure to check out the others and if you like what you see click on the subscribe button make sure that you get our newest videos right in your feed"

},

{

"VideoID": "709",

"Title": "St Louis Commercial Electricians - Hoffmann Brothers Electrical Contractors",

"URL": "https://www.youtube.com/watch?v=GMY4ToUijVw",

"Keyword": "Commercial electrical construction",

"Transcript": "hoffman brothers electrical service serving the st louis area for over 40 years hoffman brothers is an innovative provider of commercial electrical services including repair and installation our areas of expertise include standby power generation electrical service and distribution upgrades led lighting installation technical services and routine maintenance each commercial building has its own set of unique electrical challenges our goal is to ensure safety reliability and energy efficiency use a commercial electrical contractor you can trust call the hoffman brothers"

},

{

"VideoID": "710",

"Title": "Residential and Commercial Electrical Cost Estimator",

"URL": "https://www.youtube.com/watch?v=YWn--kDXUMA",

"Keyword": "Commercial electrical construction",

"Transcript": "welcome to estimate florida consulting we offer budgeting and takeoff your reliable partner for your electrical estimate costing needs estimate florida consulting as an electrical estimator is here to allow you to achieve new levels of productivity and efficiency in budgeting and takeoff giving your electrical contracting company the boost it needs to not only survive but profit in these difficult economic times as an electrical estimator we collect and analyze data in order to determine the time money materials and labor required to manufacture your commercial project help plan and coordinate projects we estimate costs for all electrical projects our estimates are based on the cost of labor and materials in order to create the estimate for your project we work on every specific needs of our clients from the start of project planning our estimate report has been prepared with the latest technology softwares like plan swift these tools increase the accuracy with zip code tracking systems all you have to do is email us your project and that's it [Music] contact us today for a free estimate of your project at 561-5300 or visit us at www.estimatorflorida.com you"

},

{

"VideoID": "714",

"Title": "Rooftop conduit run #commercial #lightwork #electrical #lasvegas #shorts",

"URL": "https://www.youtube.com/watch?v=AX4fSDQiakQ",

"Keyword": "Commercial electrical construction",

"Transcript": "I can even roll in PE why everybody notice me I can even go to sleep I'm rolling on the be they tried to give me got on my knee like Jesus please he only even believe in Jesus why you got a Jesus PE if you want to leave"

},

{

"VideoID": "715",

"Title": "Commercial lighting #electricalcontractor #electricalinstallation #electrician",

"URL": "https://www.youtube.com/watch?v=tMyUQRca4x8",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] you can drink some help me [Music]"

},

{

"VideoID": "717",

"Title": "Lake Electric Co. Inc.: Your Trusted Commercial Electrical Contractors in Hickory, NC",

"URL": "https://www.youtube.com/watch?v=iqm47Hq-AAY",

"Keyword": "Commercial electrical construction",

"Transcript": "here at Lake Electric Co Inc our company is fully insured and can provide performance and payment bonds that are appropriate to fulfill job requirements we provide support work for various utility companies at their fossil hydro solar biomass and nuclear facilities and we also have many years of expertise and new construction and up fits for manufacturing facilities of schools and colleges strip malls churches theaters professional buildings retail stores government buildings water and wastewater treatment plants electrical substations and high voltage and underground utility work if you need a dedicated commercial electrician in Hickory North Carolina we are the ones to call [Music] you"

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{

"VideoID": "718",

"Title": "Business Brief: Electrical construction industry sees growth during pandemic",

"URL": "https://www.youtube.com/watch?v=5GR8rgBSAuM",

"Keyword": "Commercial electrical construction",

"Transcript": "Travis Martinez, vice president with great Southwestern construction, welcome on the business brief. Hey, good afternoon Ryan. Now Travis, Great Southwestern is a leader in the electrical construction services industry, supporting utility as municipalities, other government entities and private developers across the country. $130 billion industry and growing. Your industry is vital to Colorado and our nation's infrastructure, including transmission lines, distribution systems, communication systems, substations, and renewable energy facilities. You gotta tell us how's the business and what's the outlook for the industry. Orion of Business right now is is is strong. It's been very strong with the last probably decade. Our trends are looking to be going forward to be even stronger over the next several years. Over the past past couple years we've had several growth stories that we always like to highlight and that's our movement into other geographic areas across the country. Although we're based out of Colorado, we have pretty much a national reach at this point in our industry is not going away anytime soon. You can see it with the fact that we're on a zoom call. Here we're using electronics every day of our life. You know there's the use and demand of electricity is just going to continue to skyrocket over the next several decades, and so our services which we provide to like you mentioned, utilities, renewable energy companies, developers across the country are are just going to increase overtime because we're such a critical infrastructure to our modern day society. Now with the Biden Harris administration, there is much more momentum Travis behind the shift to a greener, renewable energy economy when solar and other renewables, which means renewable energy infrastructure. A spokesperson for the National Electrical Contractors Association says there is a shortage of skilled workers in the electrical construction industry, which means you're hiring or you will be hiring perhaps for the foreseeable future. How does this affect workforce development and your hiring needs? Well, try and we've been around since 1977 and we have our own established a friendship program that's approved by the Department of Labor, which we've had since 1992 and through that apprenticeship program we're able to do a lot of on the job training, and so folks that might be looking for a new career change. Or somebody who's coming out of high school, for example. That really doesn't have a direct career path or pathway to college. They have the opportunity to come into our industry into our company in particular. An learn on the job through the apprenticeship program we have in place and I know that there's been a lot of focus on the last couple of years. On the apprenticeship, programs that a lot of companies like ours are able to offer people, so it's a it's definitely an opportunity. I think that the people can take advantage of where you get yourself a foot in the door in a growing industry, and you're paid to learn that industry from a lot of experience individuals and then you build your future off of that meaning you can be in the field if you want. Or you could. Take another path, which we mean something into project management or management in general with the construction company like ours. So all the way around, it's it's going to be high demand. Like you mentioned, the political atmosphere might accelerate that over the next couple years, but we think that that that story is already been in place over the last several years with a lot of emphasis by private companies and by states wanting to do a lot more renewable energy work than in previous years. So we think it's a trend that's going to continue. You think they do? You think you're talking hundreds of jobs? Thousands of jobs locally in terms of the need? And this in both your company and the industry? Sure, absolutely. I think there's no doubt in my mind, you know you look at our region in general. You know Colorado to New Mexico in other places where there's real Glenorchy mandates that have been put in place by utilities, there's going to be a high demand to to put workers in place to make sure that those projects are being staffed correctly. And so, yeah, absolutely. I think there's going to be a big demand more. Or brawl those types of the types of services and and craft labor in general. So what are we talking about? Travis in arms? I'm sitting at home, I'm I'm a dad. Got a son who's in need of a job. I'm a mom who who's who's worried about my dad, my kids future my daughter having Akarere in the renewable field. What types of opportunities are available to people and the type of training you guys are providing to to help them further those careers? Sure, absolutely I think there's going to be, you know, with people that are looking to like I said earlier, either either change careers into a different path than what they've been doing lately, or if there's a change in career. Do them. Having to, you know, reconsider another industry that they might not have thought of before. What our industry offers is it offers a steady income for one thing, because we're a specialty trade and were specialty contractor. We can offer more of an industry above industry standard wage and in summer in some places in the country, including Colorado, we can offer great benefits across the board and at the end of the day, you know we offer a long career path because of the services we provide and the trends that we see going forward. Which is, you know, a lot of demand is going to be placed on our industry to meet the renewable energy needs of the country and the continued focus on replacing aging infrastructure which is going to be. Something that we think is going to be even more of a focus over the next two years. You have the data I've seen definitely supports the trends in renewable energy infrastructure, Travis, the US Energy Information Administration projects that renewables will be the most used energy source in the world by 2050. Increasingly, big and small investors are pushing towards more investment in clean energy. And as you know, Colorado has long been a leader in this space. In my view, the electrical construction services industry is in for. Quite a ride and significant job, bro. Travis Martinez, vice president with great southwestern construction. Thanks for joining us on the business brief. Thank you, Ryan."

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"VideoID": "722",

"Title": "Electrical Fitting Name &amp; Pictures | Electrical Materials Name | Electrical Accessories List",

"URL": "https://www.youtube.com/watch?v=KzOzr\_QBGkM",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] do [Music] [Applause] [Music] [Applause] [Music] do [Music] [Applause] [Music] [Music] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Music] so [Music] so [Music] [Music] [Applause] [Music] [Applause] [Music] so [Music] [Applause] [Music] [Music] you"

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{

"VideoID": "723",

"Title": "Main electrical panel explained - Load center - service panel",

"URL": "https://www.youtube.com/watch?v=UBERduCp3Wo",

"Keyword": "Commercial electrical construction",

"Transcript": "remember electricity is dangerous and can be fatal you should be qualified and competent to carry out any electrical work connected to the distribution cables will be smaller transformers usually pole mounted which reduce the voltage down to a level safe enough for residential use on the property will be an electricity meter which will quantify how much electricity has been used and the electricity company will use this to invoice the property so if we zoom into the property we find a main service panel which is sometimes called a load center or breaker box if we remove the cover and look inside we first find the main breaker this is usually at the top of the panel but it might be at the bottom the two hot wires from the electricity meter will connect directly to the lugs on the main breaker coming out of the main breaker will be two main bus bars these are basically exposed metal sheets which carry electricity to the circuit breakers notice i've shown the current flowing backwards and forwards that's because this is ac or alternating current these bus bars as well as the lugs are not insulated they are live or hot the main breaker can be manually flipped to cut the power to everything downstream of the main breaker the main breaker will also provide over current protection to the property it is rated to handle a certain amount of electrical current passing through it typically between 100 and 200 amps if this value is exceeded then it will trip automatically to try and protect the property and its electrical circuits inside the panel we also have a neutral and ground bus bar this is basically a strip of metal with lots of holes and screws in it the neutral and ground wires will sit in the holes and the screws will lock them in place in this example we have a block on either side of the panel as this is a main panel the two bus bars can be joined together so we have a connector bar between them that way we have a shared neutral ground bus bar sub panels must have their bars separated but that's a topic for a separate video from the electricity meter we will have the neutral wire connected to the lug on the top of the neutral ground bar notice the green screw this is bonding the neutral bar to the metal casing of the service panel the purpose of the neutral bar is to return the electricity back to the transformer it does actually get a little bit more advanced than that but we're going to look at that in a more advanced complex video this is just covering the basics so the two hot wires will provide the electricity and once it is used it will return to the transformer via the neutral bar it is still ac alternating current but to make it easier to visualize i've only animated the current flowing in one direction so you can see the path it will take now if we were to take our multimeter and connect one lead to the bus bar and the other lead to the neutral bar we would get a reading of around 120 volts if we connect the multimeter leads to the other bus bar and the neutral bar we would again get a reading of around 120 volts but if we connect the multimeter leads to the two bus bars then we get a reading of double that at around 240 volts so why is that what's happening here so when we look at how the transformer is connected to the main panel we have the two hot bus bars connected to either end of the secondary coil in the transformer and then we take the neutral bus bar connected to the center of the secondary coil so basically when we connect across the bus bar and the neutral bar we're only using half of the coil so we are only picking up half the electrical voltage the transformer can provide so that way we get 120 volts when we connect to the two bus bars we're connecting to the full length of the coil so we're picking up the full voltage which the transformer can provide therefore we get 240 volts now coming back to the panel connected to the bus bar we'll have our circuit breakers these will look something like this with this black plastic casing and a toggle switch on top the circuit breaker controls the flow of electricity into individual circuits in the property it can be manually tripped to cut the power but it also has two important features the first feature is overload protection the circuit breaker is rated to handle a set amount of electrical current when appliances or lights are connected to the circuit they will each increase the current in the circuit if too many things are plugged in and turned on then eventually the current will be more than the breaker can handle and the breaker will automatically trip to cut the power off to the circuit and protect the property the second feature is short circuit protection when the hot and neutral come into direct contact with each other the current will dramatically increase almost instantly when this occurs it creates a magnetic field which will trip the breaker and cut the power automatically let's have a look at how the circuit breaker is connected to the electrical circuit in this example we will connect to a simple light fitting which is controlled by a switch we take the hot wire from the circuit breaker and run this to the switch we then run another wire from the switch and over to the light fitting from the light fitting we have a neutral wire which carries the return current back to the neutral bus bar we take the ground wire from the metal casing of the ceiling box and the switch and we also join this to the neutral bus bar as in this case it's shared the purpose of the hot wire is to carry the electrical current over to the light fitting the purpose of the neutral wire is to carry the used electrical current back to the main panel and then back to the transformer the purpose of the ground wire is to provide protection for a fault current if for example the hot wire came loose and touched the metal casing of the light fitting the ground wire provides a low resistance path back to the panel without this path electricity could flow through you if you touch the metal box as the current flows through the ground wire it will increase the current and that will trip the breaker automatically so the electricity flows through the hot wire through the main breaker down the main bus bar and into the circuit breaker from there it flows along the hot wire across the switch and light then back along the neutral wire and into the neutral bus bar along the neutral bus fire wire and back to the transformer i've animated this using ac alternating current but to make it easier to understand the path i've shown it flowing in a single direction now okay so what else might we find here well we might find a double pole circuit breaker which will let us connect to both bus bars to get 240 volts which we can use to power larger appliances like dryers ranges and air conditioning units if we look at the dryer circuit example we run the red hot wire from the circuit breaker which is connected to the main bus bar number two and we run this to the receptacle then we run our black hot wire from the other terminal of the circuit breaker which is connected to bus bar one and we connect that to the receptacle also in this case we have the neutral wire connected between the neutral bus bar and the receptacle which will allow us to get either 120 or 240 volts from the outlet then we have a ground wire to provide a safe route for any fault current now we can either connect across the two hot wires for our 240 volt connection or between the hot wire and the neutral wire to get 120 volt connection we'll also very likely find a gfci circuit breaker which stands for ground fault circuit interrupter this will look something like this and depending on the model you buy you will usually have a pigtail neutral wire connected to it gfcis are required on certain circuits where outlets are used for places like kitchens bathrooms hot tubs etc you should check with the national electric code for exact details the gfci breaker has both the hot and the neutral flowing through it this way you can measure the current flowing through both wires and ensure they are equal if we took a standard outlet we would take our hot wire from the breaker and connect this to the outlet terminal then we take the neutral wire and run this back directly to the circuit breaker to a specific neutral terminal we then connect the pigtail wire into the neutral bus bar this will provide the return path and of course we run the ground wire from the outlet back to the neutral ground bar if we look at this example the current is flowing normally until the guy sticks a screwdriver into the socket the electricity then flows through him instead of the neutral wire the gfci is measuring the current in the two wires and notices that these are not equal it then automatically trips the breaker to cut the power and save the man's life we might also come across an afci circuit breaker this stands for arc fault circuit interrupter these are required for circuits feeding bedrooms hallways kitchens etc again check with the national electric code for exact details afcis work also by being connected to both the hot and neutral wires inside this circuit breaker is a circuit board which is measuring the circuit and monitoring for patterns which indicate an arc fault is occurring these are installed pretty much identically to how we saw the gfci breaker under normal conditions the current flows through the hot back through the neutral into the breaker then through the pigtail and back through the neutral bar but if for example a screw was accidentally inserted very close to the cable and removed the insulation to expose the copper wires the electricity could now potentially jump across our arc from the hot wire and into the neutral the arc is incredibly hot and causes most residential electrical fires as the arc occurs it creates a unique signal in the electrical cable the circuit breaker can detect this and will automatically trip to cut the power connected to the neutral ground bar will be a thick uninsulated copper wire which runs out of the bottom of the panel and off to the ground rod which is pushed into the earth near the property under normal circumstances no electrical current will flow through this wire its purpose is to dissipate high static voltages from things like lightning this way the electrical systems and equipment is protected from damage additionally we'll also find a bonding wire to metal pipe work in the property this is to provide a safe route for electricity to flow should a hot wire come into contact with a metal pipe and this way it will prevent a person being electrocuted if they were to touch the pipework okay guys that's it for this video but if you want to continue your learning then check out one of the videos on screen now and i'll catch you there for the next lesson don't forget to follow us on facebook twitter instagram as well as the engineeringmindset.com"

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"VideoID": "725",

"Title": "Best wire pulling head that DOESN’T fall off #electrical #electrician #electricity",

"URL": "https://www.youtube.com/watch?v=VHNRHKVVClw",

"Keyword": "Commercial electrical construction",

"Transcript": "strip your conductor peel back then you want \nto grab about four to five strands of copper   then you want to cut it right at the end \nof the insulation once you have them all   stripped you want to take the first two and you \nwant to stagger them just like that then you   want to take the ends and fold them over and \nthen grab it right here and you want to twist   it once you're done twisting them you want \nto take the shorter end and you want to cut   these off right here when you get to the last \ninductor you want to stagger this one as well   but we're not going to cut the copper off of the \nend fold it over One Direction and then take the   other one and fold it the opposite direction \nand then you take the two of these like this   and do the same thing that you did before then \nyou want to tape them up you're ready to pull"

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"VideoID": "726",

"Title": "Commercial Building - Godown Wiring Work | Plumbing and Electrical Contractor | Chennai #MrPerffect",

"URL": "https://www.youtube.com/watch?v=ChaQGZRdORw",

"Keyword": "Commercial electrical construction",

"Transcript": "guys [Music] [Music]"

},

{

"VideoID": "727",

"Title": "being an electrician #bluecollar #industrial #commercial #electrical #electrician #hardhat #humor",

"URL": "https://www.youtube.com/watch?v=nWBINBXBXWY",

"Keyword": "Commercial electrical construction",

"Transcript": "so people wonder why why women live longer no guard rails no nothing just 50ft drop you know while working on this beautiful thing welcome to being a industrial commercial electrician"

},

{

"VideoID": "729",

"Title": "Let’s talk about electrical service upgrades ⚡️ #electricalwork #homeremodeling #constructionlife",

"URL": "https://www.youtube.com/watch?v=TnRrvLx5Rd4",

"Keyword": "Commercial electrical construction",

"Transcript": "a common question I get asked is what is a service upgrade and when do I need it for my home a service upgrade is when your home needs more power most homes only have 100 amps available you will need to upgrade if you're wanting to add a circuit which draws load Beyond Your Capacity this video is an example of a 200 amp service upgrade that we recently did for one of our clients in this case we trenched starting at the existing meter location in order to install our new panel and back fed the sub panel downstairs as you can see there's quite a bit of work involved but with the right expertise it's a straightforward project that we can take on for you in just a matter of few days"

},

{

"VideoID": "730",

"Title": "Fraser-Morris Electric Co. - Electrical Experts in Commercial, Industrial, and Building Maintenance.",

"URL": "https://www.youtube.com/watch?v=f0R52CzP7YM",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] hello i'm dick morris at Frasier Morris electric company I'm the third-generation owner we've been located in downtown Minneapolis since our inception that back in 1931 with our identity being largely a downtown contractor we do a lot of work in tenant improvement building maintenance infrastructure improvements building out office spaces for different tenant clients of ours we really cater heavily towards our core market which is general contractor's property managers leasing agents owners representatives and anyone else that recognizes us by name and who we recognize as well one of the things that sets Frasier Morris apart is the relationship we have with all parties that we come in contact with whether it's our customers the building management different unions that we deal with the trust that we have on our employees ourselves to make good decisions to work hard to show up on time to be productive when a customer looks at the construction team they can trust that we're gonna deliver a good product day in and day out we are someone that they can hire and know that we're gonna be there tomorrow we're there today when it comes to growing our business starting out at about a dozen employees when I first started in the field to be in between ninety to a hundred power Partners is confidence to know that if we land a project with a long-term client that we want to keep that we can provide the manpower necessary to complete the projects on time without strain without worry that we can deliver a product to our client and maintain that relationship going forward the power partners program which is a cooperative program between Nika and the IBEW basically represents the relationship that we have with our partners in the industry survivability of this industry is very dependent upon teamwork between local unions Contractors Association and frankly even between editor's I think it's really been a wonderful experience as far as running this company just to see what these people can do for our organization is all [Music]"

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"VideoID": "732",

"Title": "Pass Final Electrical Inspection in my Commercial Warehouse￼",

"URL": "https://www.youtube.com/watch?v=jVCwpFELXE0",

"Keyword": "Commercial electrical construction",

"Transcript": "i could show a little bit how they kind of sound [Applause] so now we're moving into the office part of the warehouse and we went ahead and did this also we did everything it's got motion sensors in every room i went ahead and put two by four lighting up at the top and moving on to the inside of the entrance uh this is uh ceiling tiles know you got your extra sign there uh pretty simple stuff here you know it's just a nice cool little ti my co-worker over there getting out the bathroom and yes sir we finished it when he finished this up and wrapped it up and passed inspection everything went smooth thanks for watching subscribe so you can watch other videos that i put out i'm starting to put out a lot more videos so go ahead and hit that notification like so you don't miss any videos thank you bye"

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"VideoID": "735",

"Title": "Done Right Electrical Services, Commercial Rewiring, Seat Pleasant, MD",

"URL": "https://www.youtube.com/watch?v=7vu7XDT0zfI",

"Keyword": "Commercial electrical construction",

"Transcript": "are you looking for a qualified trusted electrician then look no further than the professionals at dun white electrical services serving commercial and residential clients throughout Montgomery County and the surrounding area we're a top-notch electrical contractor and your number one choice for everything from grounding and new home electrical construction to home electrical remodeling lighting ceiling fans and more we look forward to helping you done right electrical services call us or visit our website now"

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{

"VideoID": "736",

"Title": "Access Electric in Tustin California provides quality electrical construction",

"URL": "https://www.youtube.com/watch?v=0UZxCWejR\_I",

"Keyword": "Commercial electrical construction",

"Transcript": "save time and money with today's recommended business and have a profitable day hi it's tom with a profitableday.com with today's recommended business access electric in tustin california founded in 2001 in the commercial electrical field they specialize in providing quality electrical systems to owners and general contractors in the private commercial and municipal sectors for new buildings tenant improvements and remodels their website provides a list of projects and a portfolio list of schools retail fitness centers and medical mixed use you may contact them on their website or call the number on your screen access electric in tustin california they are today's recommended business thanks for watching and have a profitable day you"

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{

"VideoID": "738",

"Title": "How To Manage A Construction Project Step By Step",

"URL": "https://www.youtube.com/watch?v=PDAmTebSIv8",

"Keyword": "Commercial electrical construction",

"Transcript": "In this video, we're going to talk about how \nto run a construction project step by step. By the end of this video, you'll understand \nhow running a construction project, whether   it's large or complex, and running it well is \nvery possible if you know the component parts   of how to do it and the steps to do it. So we're \ngoing to go through the two things that everybody   on the construction project should know in order \nfor them to be working as a collective team. The   other thing that we get asked a lot is how do you \nknow if you have the right team? And there's three   things that you can use to determine, three ways \nto determine if you have the right people in the   right seats and when you have those people, how \ndo you get them to communicate? There's two really   key ways to get that done, and we're going to \nshow you that in this video and then lastly,   no matter how big this project is or how complex, \nthere's one mindset I would call that you must   have as you go through so that you can make sure \nthat you're fairly in a safe environment, meaning   that you have all of your risks under control \nand that you can run that project effectively   and then really go home and be able to sleep \nwell at night because you have this one thing   constantly under control. So let's get started. So \nfirst and foremost, project management is complex.   I remember when I was first an assistant \nsuperintendent and then a superintendent,   I thought that the construction process was- \nit was extensive and it was overwhelming,   and I didn't know all of the ins and outs of how I \nshould even just manage my area and let alone the   entire construction project. So I was like super \nzoomed in, focused on this part and that part, and   am I going to get these all right and I realized \nafter doing a couple of projects, there really is   a formula and if you follow that magic formula, \nyou could run a remarkable construction project.   And so the projects that I was on typically were \nlike 50, 60, a hundred million dollar projects,   sometimes up in the 150, 250 million range. And \nif you get 'em going, they kind of start to run   themselves. These keys that I'm about to show you \nwill help you to do that. The other thing probably   some of you are asking yourself, well Jason, \nthat's fine. Those are big projects. What about   the small ones? I'm here by myself. I don't have \na lot of help. I don't have a team. I don't have   a system like you're talking about team members. \nIt's just me. How can I use the same pattern to   run small projects? And I will say, you, well, \nthese patterns apply with the exception of maybe   you don't have as many team members. But the \npoint is, I've run $200,000 projects, 2 million   projects, 100 million projects, and the pattern \nis the same. But the bottom line, the thing that   I want to communicate is that if we don't follow \nthese keys, we are going to get overwhelmed.   We're not going to make it home on time. We're not \ngoing to be happy. We're probably going to suffer,   and I mean this sensitively from some mild \ndepression or some massive anxiety because we're   really worried about how things are going to go. \nWe're going to take on too much and do everything   ourselves and just get worked into the ground and \nburn out. And so my first message in this video is   that construction is complex and you can't do it \nall by yourself, and you can't just dive in and   start to tackle it doing the tasks one by one. \nWe need to follow the system step by step, and   then the system will enable the person you to go \nrun that construction project well. So the first   thing you're going to want to do is understand the \nproject. I know that sounds basic and you're like,   Jason, you're wasting my time right now, but I'm \ntelling you, we need to understand the project.   And so the first thing you should do is get \nthe drawings, flip through all of the pages,   flip through the specs and understand the prime \nagreement. So drawing, specs, prime agreement,   and get a general feel of what is it going to take \nto build this thing? Where is it? What are the   circumstances? When is it going to be done and \nget that understanding. Now that's going to take a   lot of time and a lot of work. So here's the deal, \ngrind, get it done, get a caffeinated beverage.   Whatever you need to do, get in there and dive \nin and figure that out. Now, I told you there's   two things that your team is going to need to know \nnow. Number one, the typical details, the typical   notes and the specification items that you're \nmost worried about. I'll give you a for instance,   if you have an item where it says, Hey, you can't \nstrip these cast in place walls until seven days,   or waterproofing may not be applied until 30 days \nafter the fact, or any other really stringent   requirement that could affect the schedule or \nthe team or how you build it, you are going to   want to pull those out and list those out. So the \nproject team knows. Then with the prime agreement,   that agreement has certain provisions that might \nalso include the division one specifications that   will explain to the project team the requirements, \nthe owner's requirements for that project. And   that prime agreement is super long. But we \nneed to again, pull out the critical items   from those requirements, from that agreement, from \nthose provisions, and explain to the team, Hey,   watch out for these and watch out for these. If we \nget this done, let's work as a team and let's move   forward. So once you really understand the project \nand you have all that cataloged or listed out,   you're going to feel really confident and now you \nmight feel that you can go conquer this thing by   yourself, that you can go slay this dragon by \nyourself, but you can't. The next step is you   assemble the right team. And there's a couple \nof ways that you know have good team members,   meaning that they're a fit for your construction \nproject. So the first one is the team members that   you select and by the way, you should spend as \nmuch time as you need to assemble the team. It's   always first who and then what assemble the team, \nwho's going to build this? And then with the team,   you figure out what you're going to do. So the \nfirst part of knowing if you have the right   people is do your skills and your abilities and \nyour personalities balance each other. Meaning   if I'm like high level and I am a visionary, do \nI have somebody on my team that is an implementer   that's detailed that can really get down to the \nimplementation? So if you're assembling a team,   make sure that you have complimentary skills. \nThe second point to make sure that you have the   right people in the right seats is are they \na cultural fit, not just with the company,   which is really important. So the company's \nmission statement and the core values,   that person has to be a cultural fit, \nbut also a cultural fit for the owner,   what they're expecting and the team that's going \nto be on site. So really having a vision of what   you want that to look like is going to be \nabsolutely key. The third thing that you'll   want to focus on is making sure that you're hiring \nideal team players and ideal team players. Like   Patrick Le says in his book, the Ideal Team Player, \nthey are humble, hungry, and smart. So humble   meaning that they're willing to dive in and dig \nin with a team to accomplish anything hungry,   meaning from a career standpoint or a growth \nstandpoint or a learning standpoint. They really,   really just want to win. They're going to get \nin there and they're going to get it done. And   then smart means smart with people. It doesn't \njust mean technically smart, it means, hey,   this person can actually coordinate, communicate \nwith the owner, communicate with trades,   communicate with the team. So those are the \nthree things that we really want to hire for   as you're assembling that team and remember, \nassembling the team is your number one priority   and the biggest determinant of whether or not \nthat project will be successful. All right,   so we're having fun here. I have four more key \npoints for you as we go through this step-by-step   process. But first I'd like to ask you, if you \nlike this content, please and subscribe. We have   about 10 million people in construction that we \nmust get these messages out to so that we can   elevate the industry together. So please again, \nlike and subscribe. Love you. Alright, so for my   next point, I'm going to label it as divide and \nconquer. So I could say something boring, make   sure everybody has their right roles. But no, I'm \njust going to say divide and conquer. You cannot   build this project by yourself even if you're on \nthe project by yourself. You cannot build this   project by yourself. So divide and conquer. I want \nto see beautiful, clearly written out scorecards   and roles for everyone on the job. What are you \ndoing? What is the project manager doing? What is   everybody else on the project doing? And make sure \nthat every key role, every bit of supervision,   every geographical area that's covered has \nsomebody, a scientist, somebody running point. And   that way you as a team can all stand where you are \nand lift where you stand, meaning run point where   you are in your role and divide and conquer. This \nis one of the most important concepts that I could   ever share with you. And it's not often done. \nSo be absolutely clear with everybody's roles,   even if that seems prescriptive, even if that \nseems like micromanaging, it's not. It's clear.   And like Brene Brown says, clear is kind. We must \nbe clear about this. So divide and conquer. Now   that you have everybody in their proper roles, \nit's all about communication. I once talked to an   international lean expert in, I mean, this guy is \nthe real deal. And he consults with companies all   around the world, huge companies and he says the \nnumber one thing that goes wrong in a company or   a project or in a manufacturing facility, it \nalways comes down to communication. He said,   Jason, communication is always the breakdown if \nsomething's failing. And so you're going to want   to really elevate your ability to communicate. \nAnd once you have people on the right roles,   now you need to communicate between those roles. \nAnd so there's two things that you can really do   to elevate your communication and number one is \nto hold remarkable meetings. Meetings are not bad.   Meetings are not a horrible if you do them the \nright way. Meetings are where you get the team   together, you communicate and you're actually \nable to win as a team. In addition to meetings,   you'll want proximity, meaning that the more \nwalls and doors you build between each other,   the more barriers you have to communication. \nSo you'll want to at least have time where   you can spend time face-to-face or be in an open \noffice environment or in a conference room or in   brainstorming sessions or even poll planning or \nscheduling together. Proximity is going to help   you to increase that communication. So spend time \ntogether face to face. And so those two things   meetings, remarkable meetings, actually, I should \nsay that again, not meetings, remarkable meetings   and proximity being together will increase that \ncommunication now that everybody has their roles.   All right, two more. Once you have everyone \nassigned to a portion of the project and we know   who's running point and now we're communicating, \nthe next thing we do is identify the biggest   risks. Meaning that if I've assigned somebody to \na role or I know that they have a certain role on   a project, I'm not going to sleep well at night \nunless I know that the risks are covered. And I   want everyone to see those risks, not just me. So \nI will with the team, identify in a brainstorming   session the biggest risks on the project, and I'll \nput that on what's called a risk and opportunity   registering. We'll cover that in a different video \non this channel. But that risk and opportunity   register will outline, Hey, here are the risks \nof the project. Here are some opportunities.   This is what it costs, this is how much it costs \nus by way of schedule and here's who is running   points. So as a leader, I can trust that most of \nthe typical things are happening on the project,   but I am going to check in and communicate with \nthe team members about the risks, and I'm going   to monitor those with them and help them and coach \nthem and train them and be with them and connect   with them as they manage them themselves. \nSo a great project manager, superintendent,   or a great PR construction leader or a project \nleader will always know and manage their risks.   And lastly, monitor the numbers. I want you to say \nsomething to yourself, I love numbers and numbers.   Love me. I know that sounds silly, but say it \nagain. I love numbers and numbers Love me. You   want to know if something's going wrong. If I was \nunhealthy, let's say I was at risk for something   from a health standpoint, would I want to know or \nnot? I would want to know because then I could do   something about it. So not only are you monitoring \nyour risks, but you're monitoring the numbers,   you're monitoring the schedule, you're monitoring \nbuffers and your contingency. You're monitoring   the finances, you're monitoring your gross profit, \nyou're monitoring your contingency buckets. So to   run a project really well, once you know the risks \nand you're mitigating those, then you're going to   ask yourself, are we doing well? We've, we've \nmitigated these. Are we doing well now? Well,   the only way to know is to do a blood test on the \nproject, meaning if I want to be healthy, I go   get a blood test and they look at the numbers and \nthey're like, Jason, you're doing good. And so we   do the same thing with the project. We do a blood \ntest, we get the numbers and we say, are you doing   good or are you not doing good? And if you're not, \nwe can work as a team to really get that reigned   in and make a course correction. So I just want \nto say again the numbers love you and you love   the numbers really to run a great construction \nproject, you will want to know those. Okay? So   here's a call to action for you. And the action \nis so that you can implement, right? Because   knowledge is not power, knowledge and action \nis power. So what I'd like you to do is take   these points that are in the notes and actually \ngo through each one of 'em and ask yourself, how   well are you doing for each of these on a scale \nof one to 10, right? So if you go into knowing   the numbers, for example, how well do I know the \nnumbers scale that zero being not at all, 10 being   I've got some good numbers, I see everything on \na daily or weekly basis, right? Scale yourself in   there and then see with these steps, if there's \nanywhere you'd like to focus in the next 30, 60,   90 days. So that's personally something that I \nwould like to invite you to do so that you can   elevate your leadership and the last thing that \nI would say is that if you've enjoyed being here   with me I've enjoyed recording this for you please \nlike the channel and subscribe because we'll have   a ton of cool content coming in the future. \nSo I have appreciated being with you on we go."

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"VideoID": "740",

"Title": "Electrical emergency 🚨 service call #electrical #construction #sparky #shorts",

"URL": "https://www.youtube.com/watch?v=tlicXU7rys8",

"Keyword": "Commercial electrical construction",

"Transcript": "so here we are in our casino parking garage went ahead and replaced this pipe right here that's a brand new pipe we went ahead and uh ran the wires already when we got here um all this pipe right here was all on the ground I guess someone came in and um and took it out so this was an emergency but we went ahead and fixed it already this pipe right here it's got to go to the other side and make it up but that's it um these are one of the services you have to get out quick because obviously it's a lot of people driving by and like I said all the pipe was just hanging everywhere we went ahead and demoed it I wanted to show you guys how it is I took a picture but I can't post it on here but to the next time"

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"VideoID": "741",

"Title": "Sierra Commercial Electrical Contractors Reno Sparks NV",

"URL": "https://www.youtube.com/watch?v=6T5CiYgAPw8",

"Keyword": "Commercial electrical construction",

"Transcript": "Sierra commercial electrical contractor in Reno Nevada has over 40 years of experience servicing commercial buildings and providing electrical contractor needs in Northern Nevada our team is highly skilled and knowledgeable about all of the safety elements for large commercial projects we can handle large and small commercial jobs anything you need an electrical contractor for give us a call today at 775 624 3259"

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"VideoID": "743",

"Title": "Tri City Electrical Construction",

"URL": "https://www.youtube.com/watch?v=601EZwvLQs0",

"Keyword": "Commercial electrical construction",

"Transcript": "the most important thing you need from your electrical contractor is the confidence they'll get the job done correctly and on schedule at tri-city electric we design engineer build and integrate complex power and control systems to make your operation run faster and more efficiently our team is experienced in design installation and maintenance of all electrical systems our systematic approach to every project incorporates today's best practices in electrical construction engineering and project management we work with you to understand exactly what your business needs and how to execute the electrical work that will not only look great but function flawlessly you can count on us to design install and maintain your electrical system no matter the size or complexity tri-city electric confidence delivered you"

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"VideoID": "748",

"Title": "What&#39;s it take to become an Electrical Contractor? Find out on the Fusing Topics Podcast!",

"URL": "https://www.youtube.com/watch?v=f4TsXulH-Vo",

"Keyword": "Commercial electrical construction",

"Transcript": "first thing you need to do is you need to get a job as an electrical apprentice at that point you have to enroll in an apprenticeship program then after five years you can apply to take your test you have to pass all three but now if you want to open up a business you have to apply for a business permit in your"

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"VideoID": "749",

"Title": "How to select a Commercial Construction Contractor",

"URL": "https://www.youtube.com/watch?v=54zT\_iSWfVg",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] foreign [Music]"

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"VideoID": "750",

"Title": "Commercial Electrical Contractors Tucson",

"URL": "https://www.youtube.com/watch?v=\_\_lVLlIf\_JY",

"Keyword": "Commercial electrical construction",

"Transcript": "electrician are you tired of untrustworthy electricians have you been left waiting by unprofessional technicians who showed up late or not at all have you been surprised by hidden fees piled on top of your bill after the fact electrical problems are urgent and need to be addressed quickly so that you can get back to working and living safely as soon as possible we care about your schedule we work fast and accurately to make all fixtures wiring panels and controls even better than before in the most efficient ways in order to guarantee the safety of your home or office you need a professional with years of experience and the tools to handle any kind of job our team prides itself on quality installation and repair and we have years of experience in residential commercial and retail buildings we don't just take care of insulation we work to identify any possible problems in pre-existing wiring to make sure that your home or place of business is the safest and most efficient energy wise that it can be in addition we offer remodeling security lighting and service upgrades for whatever your needs might be don't leave a job so important in the hands of anyone and don't put yourself at risk when you can have one of our insured licensed and bonded professionals do the hard work for you we don't have hidden fees and we guarantee your satisfaction with our work that's why we have long lasting satisfied customers who trust our knowledge and expertise don't wait to have your electrical system checked and maintained call today our team is available for any questions you might have call today"

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"VideoID": "752",

"Title": "Construction scheduling | Luxury Home Remodel | Electrical Construction",

"URL": "https://www.youtube.com/watch?v=TGZN8cvHMq0",

"Keyword": "Commercial electrical construction",

"Transcript": "quick story some of the things one of the things that most homeowners don't think about when they're doing a major remodel is power is electrical if we're doing a major relocation of a wall and that specific wall happens to have the electrical panels on it or a sub panel how does that affect not only the project the cost but more importantly how does it affect the timeline because one of the items that is out of a contractor's control when it comes to utilities is you're at the whim of the power power company some of them can be six months some of them can be six weeks some of them could be two days it all depends on the individual project that you're working on and what you're doing so it's important to discuss with your contractor and at Brian contract and we look for these things up front where we try and take the lead to bring these two homeowner's attention of things that may affect the project timeline in the schedule"

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"VideoID": "754",

"Title": "6 Gang Electrical Meter Center. Commercial Electrical Service. ⚡️💡",

"URL": "https://www.youtube.com/watch?v=oc\_8om69rFQ",

"Keyword": "Commercial electrical construction",

"Transcript": "on the side of a residential house you have one meter one mask one box sometimes you have Breakers outside underneath your meter maybe have a meter panel combo here what we have is the opportunity to put three masks in the top of this thing because this thing is rated up to 800 amps it's single phase just like the residential meter down here we have a label that's going to show us a phase B phase and neutral for how they want you to terminate these lugs terminate your service conductors on these lugs um you got to put them where they're supposed to go because behind this piece of plastic there's bus that the power for each of these meter slots so we have six service rated disconnect um slots for Breakers they're going to be under 200 amps each 800 amps for the whole enclosure from the utility and then these will be smaller Breakers that just snap in like a regular brake"

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"VideoID": "755",

"Title": "Small Commercial job #electricianlife #electrical",

"URL": "https://www.youtube.com/watch?v=KBSL346LWME",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music]"

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"VideoID": "756",

"Title": "What Are Commercial Electrical Contractors Hired For",

"URL": "https://www.youtube.com/watch?v=XNvQ1kZRQcg",

"Keyword": "Commercial electrical construction",

"Transcript": "You may be asking yourself; what are commercial\nelectrical contractors hired for? These are business people who are in charge\nof constructing, installing and maintaining electrical systems in a building. Their work is very important considering the\nfact that electricity is one of the things that must be installed in every building that\nis constructed. They are professionals who spend so many years\nin schools and colleges learning how they can deliver such services. After that, they are required to register\nwith the relevant authorities and get a license to carry out the work. They therefore have expert knowledge in doing\nthis type of work. Commercial electrical contractors are not\nthe same as electricians. Electricians are just individuals who do some\nelectricity related duties. However, contractors own registered companies\nwhich are well known. Although the company can belong to an individual,\nthere are situations where several electrical contractors come together to form one company\nwith the aim of increasing their work volume as well as serving their clients better. You therefore should not be surprised when\nyou find out that the company is just one person. No matter the formation of the contracting\ncompany, you can be sure that good services will be delivered. The way they do their work depends on a number\nof things. For instance, their job description varies\nslightly from one part of the world to another. However it does not get too different because\nin the end, they are expected to do the same type of work. What is important is for the client who hires\nthem to ensure that the ones he has chosen can do a good job. Just like with any other profession, you will\nrealize that there are some contractors who even after going through the necessary training,\nthey still cannot do the job well. This means that you must be careful when choosing\ncommercial electrical contractors for your job. Most probably, there are many of them you\nhave heard of. You should not just hire a company because\nyou once heard of it. Make sure that you know what they can offer. The most important thing to do is to know\nthe unique things that need to be done in your electrical work. You then can do ahead to hire that specific\none who is touted as having expert knowledge in it. Hiring without consideration will leave you\nwith the wrong person and this will make it difficult for you to get good services. It is good to compare the services of several\ncontractors before hiring them. Come up with a list of the leading one and\nthen try to find out what they do. You can consider things like what their clients\nsay, how long they take to do the work, how much they charge for it and how reliable they\nare. If in the end you find that they are who you\nwere looking for, hire them. What are Commercial electrical contractors\nuseful for if they cannot deliver the kind of services that their clients are looking\nfor?"

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"VideoID": "757",

"Title": "Shop Spotlight: Electrical Construction",

"URL": "https://www.youtube.com/watch?v=5EI--Jey2Yk",

"Keyword": "Commercial electrical construction",

"Transcript": "well my name is Carl Jones and this is electrical trades or construction we wire houses buildings student comes into the shop and their sophomore year they start on the boards doing projects about 24 projects on the boards and then they move over into the booths they do the same 24 projects again learning all the basics splicing wiring of the receptacles switches lights then when they're done in the booze I actually team them up in groups of three and four move them into the house and they start wiring the house the junior year they come back and they review and then they go into conduit bending and wire pulling and they learn all about commercial trades and everything involved with wiring commercial buildings then in their senior year with the commercial and slight industrial under their belt they're ready to go co-op and I expect him to go co-op if if jobs are available this is the best job ever that's it"

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{

"VideoID": "759",

"Title": "Electrician POV episode 8- shooting the moon #electrician #electrical #construction",

"URL": "https://www.youtube.com/watch?v=WJfEZTKAfaY",

"Keyword": "Commercial electrical construction",

"Transcript": "this right here boys this is what you call shooting the moon"

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{

"VideoID": "760",

"Title": "Commercial Roof Replacement | Caudill’s Electrical #kernersville #roofing",

"URL": "https://www.youtube.com/watch?v=ejI4gdpXzbM",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] it's the guts and it's the glory"

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{

"VideoID": "761",

"Title": "Commercial Electrical Wiring | Outdoor Sockets",

"URL": "https://www.youtube.com/watch?v=TKZghFdOwwQ",

"Keyword": "Commercial electrical construction",

"Transcript": "so they're they're big eight blue tanks going here at some point in this area here uh and the people installing the tank made powering for it originally the originally they told me they needed power on the tank so we were going to be digging up from there to here but uh that's that's not the case now so we've got to put Power on the on the back of here yep so you know the metal plates were used over there for you know that Supply over there we're going to put one on the back of here we might just go straight across here or put a bit of Strat on I'm not sure yet we'll have a look in a minute but we do that mount the plate there and make Mount the uh 30 note socket in the interlock socket on it we've got a mountain at the other side of this board so what we're probably either just come straight out the back of the trunking or maybe put a bend on some trunking to come out and throw all the way through and just uh connect it with a bush to the the back of the metal plate out there this is a metal plate that we're going to fix on the wall we'll have a little bit of uni strut [Music] across the top and the bottom of it we'll Mount the struts of the container bolt that onto there and that will give us a nice surface to mount our 13 amp socket and 16 amp socket on all right this is a little workshop we fitted out I don't know a couple of months ago this uses a I don't know kind of like an office for vehicle washing and keep their pressure washing Machining in there's a nice little job when it was done all right we get that rcbi neutral wide in in a minute and then I just got to work out the easiest way to get out the back of here and out the wall to the other side [Music] let's get some measurements now and uh have a look at outside again seriously cool right it's going to work out where this bit of trunk on the outside so [Music] that is 105. Plus 20 for one so that bit of trunking is about one 25 up so that trunking is around about there inside what Center is it at the top well about the center of it we just need to work out where so where where's that metal plate let me get that plate thank you [Music] so what sort of get when they're on both on the back of there what Gap we got in between them so it's a fair amount in it so we just got to work before we fix that on just gotta see the best way of getting the uh the tube through because it's a One waterproof socket one interlock socket there's another box in there if you get them both out you'll you'll see and what we do we Mount them side by side we've just uh okay of coupler in between to join them together so our cabling are coming to the back of one of them and then pass through into the into the one next to it I'm just undecided whether to come straight out the back of the ball or to come out the top of the trunking with a 90 degree Bend and go through I think uh I think a 90 degree Bend is probably going to be easier I think it might be easier if we put a Bend out and through because uh it's going to be hard to drill out the back of this trunking all the way through and get it in the alignment is it really so I don't know yeah yeah or I could come straight out of the back of the ball to be fair you know straight right out the back of there we don't want to be too hard so what let's measure look like so that's 105 which is so 105 is from that metal Ridge cutting around that's the floor down there isn't it so yeah so that 105 is there that's the center of our trunking yeah maybe we do that then what what I think we'd do do you even drill through this side and then but the 100 off yeah what I might do is draw the 25 mil hole here and then put the hole saw through with an extension bit on it and then we can drill into the back of the trunking and put a bush and coupler on it without that sticking through there what would then do is drill a hold we get the uni strut on we're drill a hole in the back of there slide it over it and then we can mark off the finished face of the conduit we're going to take this off take the conduit back out cut that with a cutter on it and then put it all back in place afterwards so yeah let's do that so what what size hole through them we're poke whatever 20 mil hole in this when we do it but we're doing a 25 mil hole in there if we drill a 20 mil hole in there we won't be able to drill all the way through into the back of the uh trunking right because the hole saw won't fit any further through so you'll have a 25 mil hole in this for a 20 mil hole in that and then when it all goes together we can put a bush and a coupler onto there so let's get the uh hole saw try your own want to come over 300 mil from there let's see 300 mil [Music] and then up 105. so 300 105. so I'm just going to Mark the other side where that should come through so 105. it should bring us in the section there and then 300 mil along should be about there so we should end up coming through the back of the trunk about there so all right shut that off clear a little space and see what happens okay and then 20. do you know what the only thing we might end up with here that's all right we I was worried but we'll end up with a bit of conduit that's too short to work with but uh I don't think we will just go and have a look the other side if you look inside the trunking just under the board I put like a little cross on there and I just want to know that we're coming out in roughly the right place I won't go right through I just go through as far as the air the pilot bit you are it's in the trunk you know yeah yeah enough for us to get yeah okay okay so that's all right so let's come through the back there so what are you doing there Lee cutting up onto it let's go through the uh how are you going to get that to the right length so you well I've got if you put a cup of pre-thread it ends because that's already got one right length there yeah then I'm going to get a couple off I'm going to position it halfway so you make my mark that's that's that's my that's my fault that's your final my final Mark another Mark there that's it you've got it let's get a couple of them and put through that there so that's your one so that's your 140. that's it cut that though the only problem we might have come on I've noticed it that might end up a little bit short for threading it might not but you're gonna have to it probably will go in still but it's quite a short place to cut but it kind of is what it is it's quite short in it you should be able to get the stops and I'll slide that forward as far as you can smash your fingers up on it you're not going to do this for your nvq what photo evidence and stuff like this you probably find you definitely yeah thank you that's it and I'll uh started my fat fingers in here I'll tell you what's take it out a minute I'm gonna put the bush through the hole can you slide that copper onto the bush and turn it all right [Music] is that done up reasonably tight yeah okay well let's have a look at it out there then so if we now line that up to you that is which is fine because our metal Plate's a couple of mil thick as well yeah so that should work out perfect when that goes on so what we do metal blade will be at the Buffalo anyway yeah because then it will be flat to that it will yeah yeah so that should work out spot on to be honest that'll be all right to be fair if we if we turn that with a pair of grips we'll probably wind that in half anyway and I think we've signed that that's good so yeah that should be all right grab repairs uh pipe grips and we'll give a little turn on that [Music] if you hold this side here with a pair of adjustable spanners I've got some in my bag if you grab them around the uh the Bush when you've got it there I'll give this a nip up do let me know when you're on it that's it all right and that's uh that's probably done up the exact amount we need now all right so that is going to mount onto some Unistrut and then fix there so that'll give us a cable entry into the metal plate and then that will go over it like that single socket on the left 16 then socket on the right wouldn't it be nice really that's uh yeah what we might have to do is uh I'll tell you what I'll measure up from the bottom oh we've got 94 there a little bit sorry all right how was this day okay this is uh almost got there so this is going to be a single socket and then our 16 amp socket we're going to mount that over the uh that's got the mount over that bush so that's our cable entry into there and what we do we seal up all around the back of this so when it goes over it stops any water coming in to get a couple of uh holes Okay so is it open uh yeah yeah oh God's haircut thank you foreign [Music] and then we get the rotten caps put into the uh the strut on here and then me to just claim the Mark I putting lines off that I've put on there as well [Music] [Applause] [Music] so that's it man a couple of small drying holes in there to come off so enough there yeah it's all blaze in it so there's our singles from the container inside so we're going to come out into the socket there through again into that 16 amp socket and that'll be that done so the 16 amp sockets wide is it yep what are you doing with the singles when you terminate them twist them that's it and then if I can if you can hold them yeah the main thing is that your strands are twisted together foreign ERS do they can it can seem awkward but it's just just comes naturally yeah do you think your uh watches after you imagine as well thank you Lee thank you for watching please subscribe thanks for watching Please Subscribe leave a comment etc etc right I've joined them together so if you can uh get your raising on that remember the zero I love that there I've got the ass foreign [Music] could you just put uh cut the crocodile Clips on it for me and I'll do a High artist s [Music] oh [Music] you can hold it okay so live in nature of the mouth it's clear then we do live to neutral [Music] Perfect all right cool that's good all right cover can go back on that 16 amp socket out there I'll get these put away where they need to go to me bring them up there actually they either cover off the 16 and one because I haven't got a plug that goes into there on me so we just have to do a test at the terminals on that oh still an Earth load test on it [Music] then we're nearly done a bit labeling rcd test I've got all the we do a loop test that the distribution ball to zdb but I don't need to take any more details because I've I've got them all anyway from when we installed all this 883 uh no I don't really know either so I can do a higher current test here oh well I actually I yeah I do at the socket actually yeah so yeah we'll set that up that'll be the next test we do then we'll do the test of the hole here all right let's get a oh is it [Music] [Music] most important name cup of tea [Music] okay [Music] thank you right you got that ready have you let me do the RCB test here can I have a crocodile clip yeah I'll have to buy some batteries all right can you set that up for rcd testing you don't need to keep that button pressed right okay uh cover can go on the 16 amp socket a bit of label in here and I think we're not far off Dundee I need to sit around a bit of silly coming across the top of each of these [Music] foreign we know what the r1r2 is so you can calculate it you don't actually need to need to do that foreign [Music] labels but if I come back here to do some more work I'll try and remember to uh to print the new one on foreign all right I'll just come to the the main zone of the building we're working in so this is something I say I have me Lee and uh and Jody fitted out we finished at the start this year in January it's one of the main water heaters building so we've got our main switch we've got switches here this feeds fusible in the workshop which in turn feeds the container we're working outside at the moment there's our distribution Arrangements here on the wall this is the board for the for the office area itself it's all nicely labeled out there stickers on it a broad schedule a little surge device there what else we've got in here it's might be interesting for some people as I guess interlock for the fire alarm that's in there and file documents book for the fire alarm system reinstalled a nice bit of transit in here it's all cable trays above the ceiling there's combination of cable tray uh the office area was all done in PVC twin and Earth all the workshop area was running trunking and singles but yeah that is what we've got in here we've got a water supply coming in a nice little main uh there's our Earth bar under there they're all labeled up as you can see yeah anyway but that's a little bit you leave a job to the uh the metering company and look at the hash they made of entails we come back after they've done it they're all twisted up all I miss but uh yeah he switches the light in our external light it controls we've got a little contacts are in there and a timer for the to log in supply for our water heater there yeah this was a nice little job and ventilation we put in as well that found in the workshop now [Music] it's quite a nice job This was oh they've done all this since I was last year so we were here two months I think doing this started just before you saw Christmas when we had the bad weather so that bold that we were just looking at is down underneath here you can see that trunking rising up there can't see it too well I'm not going to move all this stuff out of the way but there's a hundred mil trunking that runs all the way around [Music] here Rises up their supplies for the shutter doors they go up along the trunk on the trunking up and along the cable tray over there that's a the fire alarm going up there supplies for the lighting as well they rise up and then go all the way along that framework up there feed the lights and that trunking that come out from there the fuse board in the main room runs all the way around you can see it just under there behind this boxing and then along and down close down in the long so she's called just [Music] this is a this isolator feeds the container out there where Lee's working at the moment that's where we just installed that power [Music] yeah Workshop fuse box this is 13 uh 25 mil singles from the switch shoes in the mains room for the summer season [Music] a little while ago nice little uh worn out a Transformer day [Music] I'm down here [Music] a bit more chunky coming down there that one you put you know it doesn't matter what effort you put into design someone whacked something in front of a sock that you fit there's not a lot you can do about it so that's not that accessible but uh I'm trying to Carries On along here [Music] drops to some sockets eh all the way along say this interlock socket there and it also goes up and joins back up to the trunk at the top yeah this was a really nice job to be to be involved in nice to come back as well be asked to do other bits and pieces which is good we won't work in direct for the clients on this I was working for a you know like a main contractor so it's uh it's nice that the main client has got back to us to continue doing work right let's go back outside and get finished off on this new Supply we're putting in and we're nearly done"

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{

"VideoID": "762",

"Title": "Flooring electrical in Commercial Offices #commercial #architecture #youtubeshorts #shorts",

"URL": "https://www.youtube.com/watch?v=YqkS9S\_Olfg",

"Keyword": "Commercial electrical construction",

"Transcript": "how the floor electrical work is done for commercial offices first decide a main DB and floor points in a layout plan for conduiting work all the conduiting is done using 1.5 in pipe and all wires meet at Main DB floor points helps distribute electricity at workstations and comes underneath them subscribe to s for more"

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{

"VideoID": "763",

"Title": "Commercial Electrical Project: Clarendon High School | Staley Electric",

"URL": "https://www.youtube.com/watch?v=8AMVcHygX5E",

"Keyword": "Commercial electrical construction",

"Transcript": "hi I'm Robert bowling I'm with Staley electric I'm the vice president of the company and I'm also the project manager for the Claridon high school arena project here we're working on with all the scores clocks and everything in the dressing rooms and score tables and through the control rooms this is an efficient arena to where it operates in all players and all coaches and all home fires knows what's going on at all times it'll be a state-of-the-art arena we feel an obligation to the school districts the community to do a good job and do a good project for them okay this is the main lobby as you come into the front of the building this is where people will take tickets and greet people and so forth and so on as you can see the different levels of the ceiling heights and stuff it presents a challenge in hanging the light fixtures getting equipment in here and as you see the arena we have the permanent lighting up but not all of them are burning because we're still hooked up on temporary power it created a lot of issues that had the back wall opened up so we could get a lift inside big enough to reach the ceiling to hang the light fixtures so we got that done you got out quickly if you can look up there you very seldom see very much pipe that's the way we like to see a job our best work is kind of hidden and covered up but when we do have it exposed we want it to be perpendicular to the building runs in neat and orderly fashion there's the control of the brain that will sit up on top we ended up having to run a 70 F circuit all the way back to that outside electrical room for that also up to Davy room which is where the controls will be and it goes from the controls up there down to that junction box in the floor which is where the scores table will be the architect and engineer designed this to where everything is utilized for storage and everything underneath the bleachers so the lighting is well lit for them to use and storage okay so this is the typical dressing room there's four boys girls side visitors home as you can see as we ran our pipe we use the structure to help support what we can run so we don't have to build everything to support structures and stuff so all our pipes are run straight and perpendicular and it looks good and it's it makes a job go well this is the brain operations of the electrical system it feeds all from the transformer it feeds several panels in here the one we saw we're in the kitchen area the concession area and then the one on the opposite side of the building one of the reasons that we enjoy working in these smaller communities outside of Little Rock is we're building an arena here where they get extracurricular activities the PE classes the basketball team all the different teams that will use it utilize this facility not to mention it's a community facility they're all going to show up here for basketball night and so you're helping build a community but you're also educating kids and in the same token and so that's why we enjoy working with healthcare facilities and school districts and we know that education is extremely important here and we're really excited to be a part of building this arena for the Clarendon school district and any other small school district that is you know within driving distance of Little Rock [Music] you"

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"VideoID": "764",

"Title": "How to Bid Million Dollar Electrical Projects #electricalcontractor #electrician #bidding",

"URL": "https://www.youtube.com/watch?v=9alJrIqWsPA",

"Keyword": "Commercial electrical construction",

"Transcript": "so how do you bid a job like this site on scene first of all experience I sit down with my guys I take a look at every single room and I see hey what do we need to do where the second biggest thing is you got to take a look at lighting control and home automation on a job like this yes it's a multi-million dollar home sitting here on the beach these people want to impress their friends and their family and other people that come up okay another thing you got to consider is that driveway we talked about you know you have to put allowances there that say Hey this is including this but it's not including that I don't have a red line diagram from Edison here a red line diagram it shows you where Edison the utility is going to drop their line where they want your conduit to run and where the meter main has been spotted again in this one it's been in that corner foreign"

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"VideoID": "767",

"Title": "Primary Electrical Requirements for New Electrical Construction",

"URL": "https://www.youtube.com/watch?v=jaZ45xAgZv8",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] good evening welcome to a the lady electrical inspector podcast I am your host Tabitha l tonight I will start with basic preliminary electrical requirements prior to the start of commercial electrical work these requirements are essential because they lay the groundwork for the early phase of the electrical construction process I have done a large number of commercial projects this evening I would like to start this segment with proactively addressing potential setbacks in the initial stages of your electrical projects what I would like to do I would like to give you information that can help you get over some of the hiccups in the early stages of the projects because of the large number of electrical projects that I've done I have had quite a few of the same issues happen on several projects in the beginning phase of the project so what I want to do tonight is just give you a few of those a few examples of some of the things that are required before the electrical work can begin on these new commercial projects my focus to make sure that when I come on your project that I can help you resolve any issues before we get into the middle of the project and then realize that something is missing so when I first come on a electrical job if I'm called there for inspection the first thing I will do I will ask the electrician where is the building permit at this time both of us will go to the general contractor that's where the building permit normally is in the Job trailer if you don't have a building permit for your first electrical inspection I can't give you an inspection without knowing that that there is a building permit for that job what I'm hearing sometimes when I get there and there's no building permit the general contractor may say that the building permit he hasn't received it from the building department that process has changed from the last few years the building permit is issued online so you may have a building permit but you must copy it and print it and have it on your job site when I arrive so what you need to do is just print it and hang it in your job trailer so that everyone that comes there to do inspections know that you are performing construction work with the active building permit the next thing I will ask the electrician the electrical contractor do they have a set of approved plans I do inspections for municipalities so what I need to see would be a set of approved plans with the municipality stamp and also a electrical plans with my organization's stamp if those prints those plans are not on site that could become a problem because now the electrical contractor they're installing work without having a approved set of plans those plans are crucial because plans will tell you exactly what needs to be done and exactly how to install the electrical work according to the plans that's the crucial part it has to be installed exactly as the plans have it laid out and if you don't have those on site I'm unable to look at anything to verify whether or not you're installing it according to the approved set of plans now there are occasions when the plan and review Department may have your plans under review in those cases the electrical contractor are allowed to proceed with the electrical work but they are proceeding at their own risk and those risks could possibly mean redoing the work if something on the plans does not meet the requirements of the national electrical code some occasions you may have to tear out what you've done already but you're proceeding at your own risk so the electrical permits that are required the electrical permits are for electrical power I will ask the electrician how many electrical contractors are on the job do you have the scope of work for all of this project normally not if it's a large commercial project they normally share that electrical work with other electrical contractors so my job would be to know who are which contractors are on the job I need to know which electrical contractors are there doing fire alarm you must have a permit for fire alarm data you must have a permit security temperature control card access those are low voltage permits that are required now if you you are a electrical contractor and you're from out of state from out of the state and you don't actually know all of the requirements the first requirement you must meet is the minimum requirements of the national electrical code but if you don't know when you come and you into our jurisdiction The Authority having jurisdiction there are a set of ordinance that you are required to have as an electrical contractor that you're obligated to work under those ordinance are chapter 1102 so that's a good start for anyone that doesn't know all of the rules and regulations to perform electrical work in the authority in the jurisdiction that's a start where you would go look up these Arness and you will find out that there's quite a bit to know when performing electrical work so that's something that it could be helpful for you if you're a firsttime electrical contractor in the area so that that can prevent you from having any major issues with installing electrical work also when I go on on the job projects I would like to ask the electrician cuz normally I'm there for if I'm there and this job is coming out of the ground I'm there for a rough cover to cover the conduits and the reason why I need to know if you have a set of approved plans it's because I need to see those plans because that's going to provide me with information of what type of raceways and what size raceways are required in the deck so that's something that I need to know and if you don't have that information like I stated earlier you're going to be proceeding at your own risk there are other things that go in the deck when you're performing underground electrical work something else that I would ask the electrician when I'm there doing Underground Service inspection I will ask them what are your separately derived systems do you have any generators on site do you have any fire pumps on site those requirements those type of system requires special installation requirements depending on the type of building that the structure of the building some of those systems require you to go underground so this is why I'm asking because if we don't get it in the ground you would have to go overhead and that could cost you if you miss it in the plans to go underground because certain condu are required to be encased with at least 2 in of concrete so this is why I need to know certain things when I am doing the first inspection another thing I mentioned to the contractors when I'm there doing my first inspection I tell them about the for seismic requirements that's something that you initially don't have to have up front when you're doing electrical inspections but that needs to be in the process of being reviewed that needs to go through plan and review someone needs to look at your seismic for all the systems that you have on that job to let you know the seismic requirements so that's something that we can do early on in the project so that you won't have any hiccups later on in the project some of the equipment that needs to have seism that require seismic protection some of those equipments are emergency generators transfer switches emergency distribution panels conduit wiring main switch gear Transformers distribution panels lighting fixtures and conduit and wiring so that's something that you need to have in the works while the project is going on if it's going on for a couple a couple of years if you do if you get if you submit this early by the end of the project we'll have that figured out the reason why I need to know about the seismic requirements upfront is because when it's time to energize your service as I mentioned switch gear is one of those requirements so if I'm going to do a electrical inspection on your switch gear I need to know what size bolts you're required to use and there are certain requirements for that so we need to have this in the works before we get to that point of doing an electrical inspection for your service I would like to give you some information on the plan and review process when you're doing a electrical job there are a set of requirements that are required through plan and review I'm just going to give you a few of those requirements for now you need four set of plans and they need to be signed by a register engineer if you have new construction with Services over 600 amps or greater you're going to need your plans to be reviewed if you're replacing work for services 1,000 amps or larger those Services need to be reviewed by planning review and new construction of any occupancies with patient care so anything where you're going to be a patient and you that those need to be submitted and reviewed also Planet review they would like [Music] to they would like to review plans for swimming pools that's a requirement those are some of the things that I like to discuss early on in project so when I'm there on that first initial inspection I've done quite a few of these large jobs so so I if there if the plans are there I would like to discuss with the electrician at that time where karum is where the pipes are coming the conduits are coming into where they're coming into the building so if I can foresee any problems that will occur to stop you from getting your initial service inspection I would try to prevent that because there are issues with the electrical rooms and this is why I'm speaking with you to try to stop some of the issues that have occurred so when I'm there we'll look at the electrical rooms because sometimes they are smaller and now that electrician has to figure out how to get so much equipment into a small electrical room and it would be a good time to do that in the beginning phases of the job so those are a few things that I have had problems with the permitting the electrical plans the submittal for the seismic requirements those are things that need to be addressed early on in the job what I would like to do I want to walk through this process with a new construction new commercial construction I want to tell you what you need to do in order for this job to go smooth and that's a starter right there what I just mentioned those few things will be very helpful in the beginning stages of the job so as I go on with this with these requirements next week I would like to discuss with you some of the things that I've had major issues with on several jobs those issues can include as I mentioned the spacing for the electrical equipment in the electrical room for commercial jobs I like to go over that I would like to go over some s um service characteristics for your vages grounded B I've had that not on too many new constructions but that's a issue the switchboard and the switch gear service equipment that needs to be suitable for service equipment for the switch gear I would like to go over some clearance issues for the switch gear lashings of the service conductors those have been problems I mentioned the seismic requirements for the switch gear one thing I always have on the job when I am doing an inspection to turn on the service I would like to go over that next week as well talking of the switch gear terminals that seems to be a problem I would like to also go over the amperage size of the next breaker up that seems to be an issue on some of the jobs that I've had that's article 240 that's something I would like to discuss and those are a few things that I would like to discuss and I will add more as I go thank you for tuning in to ask the lady electrical inspector if you have any questions or concerns please contact me on any of my social media platforms Facebook Instagram X YouTube under ask the lady electrical inspector if you would like to add any to this discussion or provide any feedback please email me at askady electrical inspector gmail.com thank you and good night [Music]"

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{

"VideoID": "772",

"Title": "Hospital Electrical work#Commercial ceiling pipe laying#shorts#",

"URL": "https://www.youtube.com/watch?v=\_RYxmWhIxaA",

"Keyword": "Commercial electrical construction",

"Transcript": "foreign foreign [Music]"

},

{

"VideoID": "773",

"Title": "Accord Electric - Multi-Family Electrical Construction Experts",

"URL": "https://www.youtube.com/watch?v=LlOHpNzNwfg",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] I am Jordan Barnes I am with a cord electric here in Rochester and a co-owner and vice-president of the company for as long as the cords been in Rochester we've been really well known for our strong skill set in multifamily since we've continued to grow we've really been able to become more versatile it's been important for us to be able to grow with our customers we've done everything from their small service calls all the way up to their LED retrofits if they're building a new project in town we want to try to do the design with Valkyria through to completion really be an end-to-end solution for them a lot of our customers over the years have really asked us to be able to adapt quickly to their problems needing a solution on a short-term basis and we can now do that with our 24/7 service department if somebody has an emergency we want to be able to solve at any time and bring onto site somebody that's going to be able to fix their problem make sure that the customer has what they need hopefully they'll call back the next time that they need help on another project a lot of the projects that we work with really get into tight timelines and when it gets busy we can adapt quickly to them and Power Partners has really allowed us to get a great team no matter when we need to add to that team and be staffed for their projects not hold anything up and pride ourselves that we got the job done when we needed to get the job done for that customer our relationship with power partners so it's really proven to show that they have the same goals and we know that the guys that we're gonna get on jobs and Throop our partners are gonna provide our customers with only the best solutions only the best service that they can get and they truly do care about our customers right now I can literally say it looking at my team we don't have a guy that I wouldn't love to have on one of my job sites I can't believe how many resources are available to me through Power Partners Nika all of the organizations that we've been able to be a part of and it's helped us it's helped me personally learn it really allows us pretty much any ability to take on a job any resource that we need fine there's nothing too big or too small that we can't do you can't say enough about our relationships and what that allows for us and our customers [Music]"

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{

"VideoID": "774",

"Title": "Temporary transformer #electric #sparky #construction #electrical #fyp #foryou #contractor",

"URL": "https://www.youtube.com/watch?v=CwjgPy\_qLdY",

"Keyword": "Commercial electrical construction",

"Transcript": "the transformer is temporary that's why i didn't mount it to the pole sight lights are for 180 single phase floodlights 240 single face driving around back i found even more work for me why can i ignore it you"

},

{

"VideoID": "775",

"Title": "iTool co at it again #electrical #construction #plumber #hvac #electrician #tools",

"URL": "https://www.youtube.com/watch?v=YrLvTVZweks",

"Keyword": "Commercial electrical construction",

"Transcript": "now itoolco provides a simple solution to keep the standing platform clear of material and tools while working in lifts and on scaffolds the itoolco tool management system keeps your tools and material at an easily accessible working level decreasing the potential for injuries while increasing productivity the tool management system keeps materials and tools neatly nested and their next ready to use position it provides a long-awaited workbench for pre-assembling Hardware before installation due to its telescoping design the system fits a wide range of lifts and scaffolds making it perfect for any job site the tool management system from itoolco [Music]"

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"VideoID": "778",

"Title": "Paul&#39;s Electric Inc. - Commercial, Industrial and Residential Electrical Service Experts",

"URL": "https://www.youtube.com/watch?v=dq\_XY-jwTww",

"Keyword": "Commercial electrical construction",

"Transcript": "I am Josh Sabatino co-owner of Falls electric we've been in business here in New Ulm since 1987 Paul actually started out as an apprentice here when it was mixed electric probably bought in 1993 we incorporated and changed the name to pulse electric hi I'm Renee Sabatino I'm president of Paul's electric incorporated when we started out in 1987 my husband and I were 5050 in the company and about three years ago my husband decided to give up some of his shares in the company so he gave your percentage to our son Josh and some to our daughter Kelsey which at that point made us more of a woman-owned company per say we're a growing company and we're excited for all the changes that we've been making we've got a multitude of things over the years industrial commercial egg currently we service larger projects along with the residential stuff our larger customers right now include the School District whinings in New Ulm here we do everything down to changing out a bad receptacle by using high-quality parts making sure that it's gonna last a long time give them a good quality up front so that we don't have to go back and service it later we're a family-owned business and we operate our business like a family we know all of our employees by name we just get to know everybody on a personal level if I send them to your house or to your place of business I want to make sure that I can trust them just like you want to make sure you can trust us in the past we were kind of limited to the amount of employees that we had that kinda dictated what we could bid on where we could work things like that but with becoming a power partner now we can scale with the amount of work that we have we can go after the larger multi-million dollar projects becoming a powered partner has opened up a lot of different resources for us we've had a lot of our Foreman eller gone through a former training program every day we're in contact with power partners of whether it's you know questions on how to do things more efficiently if we get into a new area we're able to pick up training for our employees so that we can help service our customers better [Music]"

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{

"VideoID": "779",

"Title": "SECON - Specified Electrical Contractors - Commercial Electrical Systems Tutorial",

"URL": "https://www.youtube.com/watch?v=eoNEYuZAmI8",

"Keyword": "Commercial electrical construction",

"Transcript": "here over here is the retail sections for switchboard 1 which is a 1600 amp service 400 amps sharing in between retail and here stepping over here would be to our house power back of house panels it's for a t-distribution coming in but all house power distributed panels are stepped down through a transformer which will be stepping over to here to show you where the mains come from the main distributions would be 8 h1 which is level 8 it's in the electric room stepping down to a transformer there to feed levels a l1 and 10 l1 for house power lighting receptacles common areas and stuff like that exhaust fans 9 h1 is level 9 which also high volt 480 going up but step you down to another 75 kVA transformer which feeds levels 13 16 19 22 25 and 28 which are all low volt fed through the transformer for all same common areas exhaust fans lighting all in the common area and that is just normal power over here we'll go to the 80s - which is another 400 amp distribution 480 which also will correspond with the generator as Gentek spoke about earlier once this is tripped or ignition open switch it'll then engage the transfer switch at 80s - to engage and turn on the generator which this also operates on normal power from the switchboard your elevator systems your supply fan systems your rtu systems that are 480 here and our one exhaust fan that is 480 which is pertaining to the gender which will go on that's what you shut down indicate right actually this is the one we shut down those 80s one which I was going to next this is 480 equipment that's handling the back of house elevators which is 480 supply fans 480 this 80s one here is also 480 but it's stepping down for all your common areas which this will feed level 6 12 21 and 30 which are all eeehm panels and they're stepping down from a transformer to 120 for your emergency lighting exit signs also door mags fire alarm panels booster panels that are on the upper floors and that's basically what that controls is egress path to egress all your garage lighting and and all the back of house will be lit as well any pc equipment also gets lit off of this 2 generator will always be on even one generator is on it'll transfer from this to the generator it's all corresponds together so all this will still be lit when emergency does go into effect so this is a the main for the whole service it shouldn't be we could leave this on but it shouldn't be really exposed like this but if you need to to test system this is a main breaker that you can just test instead of switching all of them on to make sure all the e/m circuits go on all that wants 10 seconds no more than a 10 second delay I counted it it was 6 actually when it lit back up so for this section that's what those are and we also have your water source here is 480 PC equipment not backed on emergency it's just domestic pump for the units and one h1 is pertaining to all your backer house which is right here this panel stepping down to 75 kPa to a 120 208 to give you power here in these equipment rooms all your service outlets any convenience outlets here on the first floor also pertains to the lobby area air handlers will be coming out of here this actual air handler gets piped out of here as well all your equipment areas on this back of house their handlers come out of this panel and that's pretty much with this these panels handles back to house equipment lighting and and convenience outlets for maintenance purposes back here yes to our overhead these two overhead sir and I do have four but two of them got abandoned because of locations and there's two others for the furthest retail spots on the southwest corners all right now this is switchboard two and switchboard three both identical 250 I'm sorry 2500 amp services coming in from APs from their step-down transformer 120 208 so these are distributed from 480 already outside this is going to be cable transfer to a tap box that is located in the front lobby and from there will transfer from Siemens busway to distribute all the power for all the meter sections for all the tenant rooms from 8 all the way up to 30 and now it's a one section Raceway so switchboard 2 controls 8 through 18 and it's a 1-1 Raceway and they got T taps which they tap off into a power mod which is a breaker for service purposes and yes switch port handles 19 to 30 which 30 does not exist with any meters but 30 gets fed down to 29 to that meter section yeah lower floors and then higher floors yes yep yeah yes so this this starts from the first floor all the way up but this only goes to 18 caps off this one travels all the way to 29 so this one has the most distant phonics in case of any faults or tripping on this meter you would have to pull this lever to keep charging it this will indicate a window here telling you that it's charge of discharge right now it's in the discharge position because it will not let you charge it again because we are in the closed position the circuit is closed we have life power once this will this will indicate if it's trip or if somebody just simply opened the circuit so it'll indicate both and then the ready will tell you it's ok once you're charged both of these will actually flip it'll say ok and this one will say charged and it'll have pretty yellow tint behind it as well so letting you know it's charged ready for you to close the circuit one that when you do that I recommend you kind of look away just for practice we've always done that but this is a very very intense breaker once it's under charge it just flings right into listen so other than that in order to lock it out you would have to open the circuit this would be the lever to then release your lockout tagout if for any reason you need to service from this section to the top box if anything needs to be serviced from the meter sections they have their own lockout breaker that you could lock out there and they can service any meter sockets that they need or pull them or whatever they need to de-energize but at any point of time if you needed to energize here that would be the process and this will be the lockout mechanism it won't engage unless it's open so a lot of these are all the safety fixture features that Siemens puts into their main breakers other than that that covers the busway on the distribution and all right this is one of the meter sections off of switch board - this is the first power mod that you'll get off of the bus duct riser which is a switchboard - feeds from 8 all the way to 18 these are all your meter sockets everything's labeled room number per room number its identification for APS so they could do their billing over here is the switchboard 3 bus run which will feed the upper floors this is just a continuation through the floors and once we get to 19 you'll start seeing the same tap off power mod and meter section all of this distribution is 208 120 208 excuse me then over here we have our house power distribution this is 9 H 1 where it first comes to stepping down to the 75 kVA transformer to 120 208 coming to a disconnect distribute to the low volt for all your common areas lighting and receptacles in these lobbies and corridors exhaust fans this will be feeding 13 L 1 16 19l 122 l 125 l1 and 29 l1 so excuse me 28 l1 and that's normal power then you get up to level 12 you'll have another high-level panel as well a tap to a transformer and that'll be your emergency powers which controls these boosters that we have on each floor all of this fire alarm has to pertain to all the emergency egress you also have grounding if anything is to be added or anything you have your grounding purpose here for all equipment all this is protected by our grounding rod form that is directly located in our electric room other than that this is uh these are all for the tenants rooms here ApS has shut off as they please or when tenants move and move in though just flick accounts and that's pretty much it"

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"VideoID": "780",

"Title": "Commercial Electrician Birmingham - AM Electrical Installations",

"URL": "https://www.youtube.com/watch?v=cT7bDJ-qRe4",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] your heart astonished black hammer the trail is a feeling I don't want anyone you won't fall in love again [Music] opened up to many attempts to be let down [Music] [Applause] venters's I'll build a wall around myself cuz I don't need no one to make me happy but independence is my well the other thing that comes from love is sorrow"

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{

"VideoID": "781",

"Title": "How to Estimate Lighting Control Systems for Commercial Electrical Projects",

"URL": "https://www.youtube.com/watch?v=2WYp459E\_LQ",

"Keyword": "Commercial electrical construction",

"Transcript": "hey everyone sorry we're a couple minutes late they're just getting our ducks in a row but thank you for joining us for today's youtube live webinar our topic today is how to estimate lighting control systems for commercial electrical projects and i just wanted to up front explain a little bit about how you can participate during the webinar there's the chat off to the right if you're logged into youtube you can ask us questions or you know just comment however you like or underneath the the video you're watching right now there's a link to a google form you can submit your question there and we'll get to your questions as we move forward here and i want to introduce myself derek dela cuadri i'm the president of vision infosoft and we have quite a few guests today you know brian hoffelder he's here today is our training and software development expert and we have two special guests the candels mark and linda kendells are here their company kandel's estimating started 19 years ago and they are going to take us through today's presentation i also wanted to mention they have a new service that they're going to go over today towards the end of the webinar so hang out and we'll get to that estimating training service that's brand new and one of a kind so i'd like to bring it over to you mark and linda to kind of take us through this uh presentation all right well welcome everybody uh again i'm mark candels along with my partner in crime linda candels hello and uh we own kandel's electrical estimating and training we're going to talk about lighting controls today and how it relates to the vision infosoft product and also epic pricing so we're going to just kind of cruise over the definition of lighting controls because lighting controls is really a very vast i guess definition or whatever whatever you want to call it it's anything that controls lights so here we have switches dimmers um all types of you know devices that you have that are pretty pretty standard here and also i just want to point out hey you know if you got questions shout out throw your questions up on the the chat there and we'll answer them as we go so linda uh what do we always say when we talk about what we see in the symbol list never assume that it's a standard symbol yeah you know what you're right some engineers get cute and you think you're looking at a key switch and it's actually something entirely different um i don't know why people veer off the standard path but occasionally they do so don't let it bite you in the in the keystone there look at look at the symbol list and make sure you know what you're taking off exactly so here we have a legend that was on a job and they actually gave you all the subscripts off to the off that are right here we're going to kind of cook through some of these samples you know lighting controls can be single pole switch three-way switch key switch four-way switches and all the appropriate wiring you know we have pilot switches you know you got an s with a p sometimes you'll have an s with a t some people think they're um tamp or some kind of uh toggle switch or thermal rated switch we have an s with an m that's a momentary contact so again we're going to toggle maybe a uh a contactor or something like that and we've got some more time switches dimmer switches and again we have a four-way switch in here but uh one of the switches that a lot of people don't think about is explosion pro switches or weatherproof switches so we like to uh like to bring those out when we're talking about lighting controls um you know this is this is one of the areas where we have a pro tip where we always say read the specs you know what kind of devices are they looking for especially um device plates you know we have plastic plates metal plates paintable plates uh stainless steel switches plates decorator like the decora and let's not forget the really expensive like the lutron or the screwless covers those are really expensive and they are and then we have multi-gang switches and i know brian when i've taken brian's classes in the past he's always an advocate of make sure you count your one get your one gangs and your two gangs into three gangs because you know you don't count them all as individual you want to make sure if you've got a two gang switch you've got two single poles within the within that box and then of course you have your two gang plate or you have four gang plate exactly so when those could be quite expensive so you think about if you were carrying the cost of a single gang plate like four times it's going to be a lot less money than a four gang plate which you're supposed to carry so right and it kind of throws off your estimate and what you're going to buy later you know a lot of people they take that estimate you know cradle the grave and they're going to go buy what's in that estimate so if you've got a lot of one gang switch plates and really they should have been a combination of two gang three game four game switches what are you buying now so you're really buying the wrong bill of material and that's why it's really handy especially in abm to take them off correctly that's right so also lighting controls we have photo cells we have time clocks and again read the specs on time clocks because they can get quite pricey uh some of these astronomical um time clocks can be a thousand dollars again if you're doing a takeoff either send that out to supplier or open up you know epic pricing and get in there and and check the pricing you know epic is going to be pretty pretty um pretty close to what you're going to end up buying it for including freight uh and again check for availability if they specify it a a time clock you know the key is you know if they specify it make sure that they actually can get it these days it's not like it was two years ago where there was an abundance of time clocks or lighting controls you've got to see what's in stock because you may have to qualify your bid that they don't make this that they don't have this time clock available anymore you know we want to offer a substitution and that's the great part again about epic pricing because you can look at the ore equals right right yeah so uh handy to have so other lighting control says we have lighting contactors and then we have lighting control panels and then we get into the low voltage stuff which is really the meat and potatoes that we want to talk about today so we have you know line voltage or a low voltage occupancy sensor and you're going to have to read the specs of and and the drawings too of you know how do i know if it's a line voltage wall mount aux sensor or a low voltage one and one of the key tips is are there power packs or how big of an area is it going to control you know if it's just a small little closet you can get by with a line voltage 120 volt 277 volt occupancy sensor in the wall or even one up on the ceiling but if it's a large vest area we're gonna need multiple power packs so chances are the the aux sensors or the the uh the sensors themselves are gonna be low voltage controlling those power packs so then we have a vacancy center so you know the vacancy sensor versus an occupancy sensor um melinda is there a difference or isn't there or is it just a play in words i personally think it's a play on words one says somebody's there and one says somebody's not there yeah and it's really the same thing only said differently that's right so then you have your you know what we didn't really talk about in our powerpoints passive infrared versus um uh what's the other one there i'm drawing a complete blank here um multi-technology yeah the dual technology dual technology sorry so um you know i'll just mention that real quick when we're talking about the sensors and when you want to figure out what types of sensors are specified you have um infrared which it sees you right it doesn't hear you it just sees you and then you have the passive infrared so it listens for you and sees you so if you see a pir in front of the the um the device or in the specifications uh those are handy for big areas with maybe cubicles or if you've got large bathrooms where you get stalls you know that that device is going to listen for you and hear it and see you you know so if you've got a big wide open area like a warehouse all you need is just pass it all you need this is passive infrared because it'll see you but if you get a lot of barriers in the way you you want the dual technology there hopefully i said that correctly um then we have these low voltage control switches we're gonna see them on we're gonna see them on a riser coming up here but um you know these are very common these low voltage uh control switches where they're gonna have like a a switchbank somewhere and uh in this picture here we see we have zones one through six with an on off there so we can turn on and isolate areas so that's all done through a cat5 cable that i believe brian's gonna show us a little bit later on how we put you know sample of how we're going to take them off and put them in the system here but um when we look at these i'm actually going to go to the riser which i believe is the next slide over here uh this would be a typical lighting control riser and this is where uh an estimator or you know even a you know small contractor that's you know got the estimating program and he gets this riser and they get overwhelmed so um linda why don't you tell us how we kind of introduced you into lighting controls because i remember years ago throwing linda into the defense saying hey go take it do a takeoff on this lighting control riser and i was i was literally overwhelmed like what do i do with this but really what's interesting is the occupancy sensors are normally shown on the drawings or the lighting control panels and then there may be other modules that aren't shown that are shown on the riser which you just have to make sure that you put some um labor to and of course you don't have to include the material price because it's going to be part of a quoted system and then all the all the rest of it is is just the wire and it's usually cat5 or if they they may specify some other kind of wire but it's really not as complicated because if something's not shown like say for example a control module of some sort then maybe you decide that you're going to throw 75 or 100 feet at it and that's literally you're just trying to cover the cost you you don't have to be exact in your bill of material because this is an estimate it's not an exact amount so you know once you get a couple of these under your belt you're like you know something that you thought was going to take you hours to do literally can be done in less than a half an hour yeah maybe 15 minutes it's just a simple you're going to get that device that six button scene control switch or area switch it's really going to be maybe a stub up above the ceiling or just a plastering on the wall with a cat5 cable going down there and you're going to land those eight wires on the back of that device terminate it screw it to the wall and you're done and let the the um you know the programmers program the device back at the head end so it's really that simple same thing with an occupancy sensor you know you're going to have a low voltage cable going over to maybe it's just a 16-2 or or it could be a cat 5 cable you know again you got to pay attention the riser here and you'll have on this riser that you see you have these little triangles there and each triangle corresponds to a particular cable i can't really zoom in on it but you kind of get the the gist of it here so again you're going to mount that device onto a onto a box or a plaster ring or even just a couple of zip it screws into the ceiling there and land that cable in the back of the device they can be that simple you know all the all the work really is at the head in the panel landing all the wires onto the proper under the proper zones and again that'll all be designed in coordination with the the lighting control um vendor so they'll have it all programmed all you guys just run the wires and land the devices so let's uh move on to our next slide here and okay so speaking of wiring you know we talked about cat5 cable um lutron systems they have their own um proprietary cable they called the grx cable and they've got a couple different versions of the types of cables that they use and i'm just using uh that as an example uh there's some other great you know lighting control companies out there as well besides lutron but that's just one of the bigger names that people use but the new thing that's been out for about five six years now is led lighting and the nice thing about led lighting is you can dim them you can control them you can actually have areas where all the light fixtures on the outside walls where we have windows can be zoned so you can have them brighter or not as bright so maybe during the day when the sun's out you'll have a photocell sensor again a low voltage sensor going back to the uh going back to the lighting control panel saying hey everything in the within 10 feet of the the glass here we want to dim it down to next to nothing because it's bright enough outside and that's all part of that energy management savings um that you stay late our daylight harvesting exactly thank you linda daylight harvesting so how do we achieve daylight harvesting well we're using a product called luminary cable so it's an mc cable or it's a romex non-metallic romex cable and it's got your typical black white green as you need for power right and then we have a control cable and it's a sixteen two generally you know encased in that cable it's a hybrid cable and that low voltage piece just daisy chains between all light fixtures so again you can control the fixtures individually so you can actually daisy chain them all each fixture uh gets wired back to a zone um you wire them all in into a zone and you can control them on and off and dim them accordingly you can also change colors so maybe if you want a brighter at night and a you know i guess a cooler or a hotter color uh correct me if i'm wrong linda when we get up in the bright bright you know 5 000 kelvin versus the the lower 3200 kelvin was more of a yellowish color uh you know the brightness so you can adjust those as well through these um these lighting systems um brian did you want to do do you want to just take a show us what um ebm has for luminary cables we want to take like a light fixture off or something like that yeah that'd be perfect my screen's up derrick yep okay so i've put a this is the fixture takeoff module and ebm you assign letter number combination letters and numbers to each fixture a1 b1 f1 whatever it is now i've selected an led here oops that's not the one i wanted let's start over sorry i already had one set up so i'm going to say we'll call it a2 and then under the description here good grief we've got an a2 already okay let's start that over sorry about that we're going to do a z1 i know there's no z1 on this job so i'm going to go to description i'm going to put led i'm going to do a lay-in and i'm going to do a 2x4 now down here under accessories we can include things like a box or any other kind of mounting materials but we have this little tab for conduit wiring cable and when i go to cable i can pick the the standard mc cable up at the top or down here under luminary cable we've got the 12 2 with the 16 2 mark was talking about then if i put in 20 feet per fixture let's say we're going to put in 40 of those then every one of those fixtures will get 20 feet of the luminary cable that's all there is to it it's pretty simple you know so it's not it's you know when people say see that luminary cable you know they they're like deer in the headlights they just freeze up and you know it's just what do i do okay you know it's just it's a cable with some terminations so you know the led lighting fixture may have a little bit more labor to it because you've got another pair of wires to land on it but it's very very minor but uh you know it is expensive it sure is yeah uh i was pricing up romex uh for a client that was doing actually linda was working on a very high-end home um and all the light fixtures were were wired in the luminary cable and i almost fell over was almost over a dollar a foot for romex so everything's up there too so all right so um we'll get back to our powerpoint here so this is the mc cable luminary uh type and it combines both power and control circuits under one armor and uh these cables are they're primarily used in commercial construction we do a lot of casinos with them i haven't seen too many condos but i know a lot of hotels that do them shopping centers and that's going to be more for the architectural type lighting when you want to when you want to change zones and controls and what have you and then we have the the accompanying um cable and an nmb or a romex type cable and uh they use again a lot of smart buildings here so uh southwire makes a product they call it the pcs duo cable other other companies called luminarian they all have their acronym for it so but it's pretty much the same cable here so let's talk about a little bit more about uh the controls you know we've got that low voltage um lighting but somehow you're gonna need a driver for them so maybe you're not gonna run 120 volts or 277 volts to these lights we also have lights that can be run off of what they call power over ethernet so you can run a cat5 cable daisy chain in the none of them and they're actually controlled through drivers and what controls the drivers the lighting control system of the panel that again that may be just a data cable going back um to that control panel that data cable can maintain communicates with these drivers uh maybe it'll bring 110 volts into it just to feed the power pack of the driver and then low voltage goes out and daisy chains all these lights and again that's all through drivers and again pay attention that riser because every system operates slightly differently so don't assume okay so what we're talking about is lighting control effects you know the the what's in the house so what are we trying to do we're trying to produce the right amount of lighting how are we going to do that by brightness or dimming you know we can make the lights brighter we can dim them right where is it needed uh well we're going to zone the lighting to the controllers we're going to zone the areas so we're going to use controllers to zone all these things and then when is it needed well maybe we need to automatically adjust the lighting when it's unoccupied right vacant uh as linda and i discussed earlier is occupancy when is occupied or is it vacant and then maybe we want to talk about when it's really bright outside when we talk about that daylight harvesting so and again remember if you have questions let's post them up there now let's not wait till the end there it's getting populated and then derek can hop in and and intervene here so what else when we're talking about the what's in house right lighting controls are evolving every day every day they change you know you go to supply us and there's always a lighting rep out there showing a new product that they just came out you know we go to the trade shows we'll go to the nika show with the ic show and all the other shows out there the the bixie shows you got the uh uh all the the lighting shows there's always something new out there it's evolving every day technology incredible so again we're trying to what produce the light at the right color the shade of the color right so uh if we're in a casino linda loves this because we actually did a lot of work in several casinos and at night you know they'll actually raise the lighting to get you to think it's still bright outside they'll mentally mess with you to get you to think it's still early so you stay at the tables longer right one place that i think is really cool is the venetian if you've ever been there and when you go out to that place that looks like an italian piazza and it's always twilight there it's always dusk you know um and you think it's you know just the sun has just gone down and it's early evening and i've been there at 10 o'clock at night and been totally messed up because i think it's still you know 7 7 30. and it gets you to stay longer so they they can use that that lighting to control not lighting controls to not only control lighting but to control people's behavior which is interesting absolutely uh derek did we have a question that just popped up yep yep yep how many lights can be on a power pack and that is a great question william and um it all depends on the system right lights led lighting you could be looking at rope light or tape light or or linear lighting and it's maybe three watts a foot a watt and a half a foot and then you've gotta upsize the the power pack appropriately you know you can get various different power pack sizes so again i would defer that question back to the lighting vendor so when we do a take off we'll make some assumptions i'll just say hey look we can get so many feet i can get like 40 feet of led lighting you know maybe cove lighting on a power pack but i'm not going to assume that what i try to do is i go back to the lighting rep and say hey look mr lighting wrap i've got so many feet of lights i've got so many laying two by twos so many two by fours uh this you're specifying the product you tell me how many power packs we need um but uh william if you're doing something small you know just when you go to supply i'll say hey look how many feet can i put on this power pack and just verify with them you know it's it's not as not an easy question as as as we think it could be so getting back to our what's in house okay so we can produce the light at the right color or shade so we can separately dim zones of the leds with different colors of white lighting correlated with temperatures right so we can have bright lights and then we can accent the lights on the outside wall or an accent wall that um you want to change the colors and have like a warmer lighting on that we did a restaurant where they had birch trees really they cut down birch trees and they had decorative and they would change the scene the walls to the seasons so in the fall it would be you know bright oranges and reds and it looked like you were in this fall setting in the middle of winter they brought it up bright nice and white the snow and and uh in the summer they'd make it look bright like uh you know different colors of the sun so you can do a lot with lighting controls and it's really neat to if you pay attention to what the what the scope is uh it'll it's interesting to uh to see so what else uh we can allow remote programming and control we can have uh you know your iphones your ipads you have apps there's an app for it there's an app for everything out there these days you know um i looked at a job yesterday they have electric heated toilet seats and there's an app for it i i almost fell over i was actually looking at a job yesterday and there was an app for electric heated toilet seats i i almost fell over and the craziest part is it wasn't it's in florida yeah it's not like we're talking alaska crazy people are building a multi-multi-million dollar home and they have an app for the heated toilet seats so okay so little uh moving right sorry there mark i i bought a uh portable heater oh about the two ago from costco yeah i brought it home and and it i looked at it and there's there's no remote control for this it was supposed to have remote control it was an app you had to download the app and then you you turned it on and off and set the temperature and the all the controls with your app on your phone for a little fifty dollar heater yeah and you know linda and i built a new home uh just over two years ago and we bought all these paddle fans and um come to find out they didn't come with controls either they had an app for it and the funny part is you had to use you know you got to combine them all there was there was um apps out there where you could combine all the fans so you'd have them all come on at once or off and you could take the lights on and off with the led lighting controls you could dim them uh the the problem was we had we we changed our wi-fi password once and it took us weeks to get everything fixed so that's like you know a disadvantage to having an app here so uh you know how a control systems with programming lighting management capabilities you can you can do all these uh programming with it and um and tell how your lights are performing you know some of these apps especially the really high-end lighting control systems will actually tell you hey uh derek um you've been using these two by four lights and they're there's we're starting has some wear and tear on them you know you're not at a hundred percent anymore you know the the you're down to like 98 or 95 um efficient now so maybe we want to change the color to adjust for that inefficiency so these apps are really smart the lighting control systems are getting really smart it's interesting it's going to be interesting seeing the next couple years too how things evolve here so uh we got more housing wise here okay there we go so um benefits you know the visual visual needs as you can see in this picture here we've got it wider to the left and then we've got medium and then we've got warmer to the right so it looks like we have a hospital or something like that and maybe you want the people to feel cooler out in the lobby and then maybe you know you can adjust it so here we go we we we can you start off with the 55 um 100 kelvin there and then you know we go to the 3 800 kelvin that's dim to 75 percent and then we go down to 50 you know we're combining brightness the the color with dimness too so again that's all done through lighting controls so it's great for changing space appearance you know facilitate different functions on the space you can take a space and make it multi-functional just by changing the lighting control system it's it's interesting so uh you can alter the atmosphere of the mood you know um maybe if somebody's not feeling well in the in the hospital bed you can brighten them up you know you can cheer them up so uh you know changing colors of lights can change your mental your mental um uh what he called uh vision i guess all right so uh and again increase the user satisfaction by providing the users the ability to control their lighting um let's move on to the next level i have a question oh we have a question excellent yep mark asks with some projects requiring a five-year control let me put it up here year control warranty and programming trip costing around one one thousand dollars from the factory have you seen estimators adding to their bids to cover the warranty and that's a great question mark um we teach just that in our estimating class when we talk about uh writing your proposal letter all right you have a specification now that's calling for a five-year control warranty on this project that means mark your company has to honor for the next five years anything that happens to the system now it may not require your time but your lighting control vendor that you purchase this through they're going to have to cover that cost as well and you're going to have to cover some additional time for it you need to you need to throw some money in there for it getting back to time clocks when i talked about time clocks earlier one of the examples that we used in our training program is is there was an architect or an engineer that specified a particular brand uh time clock and the spec called for a three-year warranty on that time clock well the manufacturer i'll just use a name intermatic whoever it was they only come with a one-year warranty so how do we achieve a three-year warranty on a product that only comes from the factory with a one-year warranty and you can't buy the additional one-year warranty um what i always explain to students is if it's a thousand dollar time clock maybe you need to buy two of them carry two on your bid put one on the shelf and then you know you're gambling you know it's like an insurance policy whether you're gonna have whether it's gonna fail or not and then after three years you've got an extra time clock yeah it's kind of the same thing with this this five-year control warranty you're gonna have to cover something because you own it so in your bid you know anticipate something happening and you know there's some people out there that will hold you to it and and say hey look i'm not sure you know you coming up in that five year warranty and they're gonna call you back i'm not sure if this was working right can you come out take a look at they just want to make sure they're getting the money out of you and there was really nothing wrong with it but you know there's there's all kinds of games but that's definitely something you're going to want to think about and when you buy the system if it's in the specification you make sure that that quote comes with that you know five year warranty so that's something you wanna you wanna watch uh that's a great question mark thank you so let's see we're gonna continue on this is we're actually getting to the end of our powerpoint here but um control zoning you know here we got we've got a zone a zone d b and c and you could break down office areas into zones all right so maybe the people i'll just use uh i use a uh for example linda back in the 80s after graduating college she worked for otis elevator so she worked in the area for the call center all right so let's just say zone a was the call center that's man 24 7. so if you're in the elevator and you accidentally hit that emergency button it's going to ring the otis elevator call center ring ringing hi it's linda um you want those lights on but zone b c b c and d those people have gone home for the weekend they're home so those lights don't need to be on so we can break up the zones and again that outer perimeter of the building we can actually do some daylight harvesting and break out those areas again to help save energy so and then you get the zone e which is the common hallways um and the elevator uh lobby there so maybe those areas we're going to have some additional controls like occupancy sensors maybe at night all the lights go off and then as people start walking down the halls lights come on because we have occupancy sensors or vacancy sensors however you want to look at it so you can break break the buildings up into zones and uh the control system is great you know they're smart you don't need to turn on the whole floor of this high-rise because somebody's walking in zone a so that's why you want to break the areas of the zones so it's an important aspect of lighting control systems and design as zoning is the mechanism through which lighting controls are assigned to the lighting loads you know so that that can that can be very helpful so um i believe we got another question derek yeah we got a comment we got a comment regarding the uh warranty can we gary i'm sorry go ahead derek how dare you uh thanks mark jim says we carry additional costs for extended warranty and to cover a certain amount of callback based on statistical probability of failure rate yeah that's that's why you that's why you always keep historical data um on your projects so if you you can kind of anticipate you know the past is a good indicator of the future so if you keep you know good notes and you you will be able to anticipate those those um statistical probabilities like jim just mentioned that's a really good comment yeah sure is absolutely so um you know all these systems you know they roll back to a control panel somewhere some and most of them are software driven so here we've got a lutron uh looks like an ipad a lot of times they'll take these to the mountain right to the wall uh have some kind of you know years ago it used to be an iphone that used to be mounted up there now they're getting bigger into ipads so here we've got we can we can um we can adjust schedules daylights we can even control shades open the shades close the shades you know hey um we're gonna uh this classroom we're gonna show a movie now teacher goes over to the ipad on the at the front at the at the desk says close the shades dim the lights she may have a mode set up for watching a movie um she may she may have a there may be a schedule that knows that this class goes to lunch at 12 15 every day so at 12 16 it dims all the lights maybe turns them off and leaves maybe one or two random on there and it can be overridden with you know an occupancy sensor or vacancy sensor oh the kids came back or the teacher came back the lights came back up and it'll sense okay she's gone we can bring it back down because the schedule says we're going to keep these lights off now the whole thing is about saving energy and in this picture here you see that we're saving 25 right now because you know it's showing you the savings which is it's one of those happy field goods uh out there so various apps and software support implementation of lighting control systems you know the most robust software is available for centralizing your intelligent network lighting control systems you know most of its residing on a server or on the cloud a lot of this is you know you have these apps go out to the cloud the software may provide many functions such as you know the discovery of the control points so let's just say we're going to add a new occupancy sensor in this area that was just renovated you know you make turn it just like a bluetooth put it in discovery mode the app's going to find it turn it on program it it can be that simple so you can assign it control points to zones you can program the sequences of operations for zones you can calibrate centers you can actually put what we call pet alleys in these zones so if you have a an office cat as we have here at candels we don't want the office cat turning on the lights in the middle of night so we actually there's an actual zone through the app where you can say you know everything four feet or under turn off until the cat jumps up on the desk and that's a different story so we actually blocked out the desk and that turned into another another problem because when he sat at your desk and it would turn the lights off because you were blocked out in that zone so you just gotta find that happy meet him or keep the cat locked up so um uh you know calibrate sensors you can monitor the control points and issue service alerts alarms you know if a device is not working it's going to report back and say hey we've got a problem with the system here so that's handy to have and then again these this data since it's on the cloud it can be backed up and event logs are are created uh and you can also um create access and user logs and levels too of what hey um linda's coming in to work because it's saturday she only has access to certain areas of the system she can go up to the ipad there and uh you know tell her what to do so that i believe uh we'll go over to some other things brian you have any more that um that you have another we have another question yeah you do um let's do his job we'll we'll come back in a second here uh jim added are you finding in your commercial projects that the mechanical bas ties into a lot of the electrical systems and yes the answer is yes the building automation system the energy management system uh the bms building mechanic uh building management systems all these acronyms out there we're seeing that a lot and a lot of them you know they're they're intertwined um some of the some of the larger buildings you'll have like an energy management vendor like a siemens or uh johnson controls they'll go in and they'll cover all the lighting controls and then the electrician may just have to terminate the devices you know every project's different but yes jim we're seeing that a lot especially on the larger projects where they want to control the occupancy sensors the vacancy sensors with the hvac system if nobody's in the room why are we keeping this place down to 71 we can bring it up to 75 76 77 or why we run the heat when nobody's there you know the cat doesn't need the heat believe me so um yeah you want to control the mechanical systems you know if you've got these systems are so smart all right maybe if there's stagnant air because the window the um the shades are all up and it's really hot maybe they want to turn on the fans to keep some air moving so um there's uh there's a lot to those systems they're smart smart systems all right and then you have another one and we will um pause here and and give you some more some other information while you think of other questions but we're going to do this one more question here and then we'll jump into some extra information instead of using luminary mc cable are there instances where you would run standard mc and a separate lv cable from a fixture and the answer to that is yes uh it's you know when they start first came out with the led controlled lights uh they were just running cat5 cable and just crimping on rj45 and just plugging them into the fixtures then they came out with this luminary cable which was a combined hybrid cable with both in there but yes john you can you can you can use two individual cables um you got to look at the cost cost versus benefit you know is is buying luminary cable more cost effective than pulling two cables and then think about that labor you know is there a labor adjustment to pull one cable versus two cables so you got to go back and look at and and play with it you know to do a take off um take off uh 50 100 lights with a luminaire cable and play with the cost of that and then take off an mc cable and a 16-2 cable or cat 5 cable or whatever is required put the ends on it and see what's more cost effective because it may be cost effective john just just run those two separate cables you know you gotta it's it's a play with numbers and the nice thing is you can you can do it two different ways in your system but you gotta look at what the specs say also that's a very good point it's a very good point when they make sure your model that's right because when they first came out with the controlled systems the question became can i pull that low voltage cable in the conduit with my 120 or my 277 volt thn and my wire and everybody a lot of people jumped up and down said no you can't um well they do make cables that's rated for one you know that has the same insulation rating as your th hhn or thwn that you can put it in the same raceway so you got to pay attention that but like linda said read the specs pay attention that and then if there's if the specs are you know more um open that you can work with you know play play the numbers see which one's going to be more cost effective you know because the bottom line is it's all about being profitable making making money but also offering a quality project that's cause that's code compliant and meets the end user's needs and requirements as well so um brian uh derek do you want to take this one or um yeah so we have the contact information up here and i wanted to give brian a moment to mention upcoming electrical bid manager training that he will be hosting yeah we we've actually got classes coming up next week in tampa on tuesday and wednesday some introductory classes some advanced classes we have a class where we actually take off a complete 11 000 square foot building from beginning to end and then uh in you can check our website we've got classes coming up in austin later in april and then we'll have classes in las vegas in the second week of may so those are all in person and we also do virtual classes once a month again check our website for the the the classes and the dates but once a month we offer the introductory classes the advanced class the takeoff lab class we do all those virtual and we're also doing doing them in person too excellent yep so check out that's visioninfosoft.com for training on our software and mark and linda i just wanted to say thank you for joining us today and putting together this presentation because i know it's something that we get asked about here at vision from our customers and it just seemed like a perfect topic for you guys to cover sure well thank you and um you're welcome and you know we love participating these things i think we went a little bit longer than you you asked us for but uh you know we wanted to make sure we got the info out and had plenty of time to answer the questions and just a little plug about uh kandel's estimating training we are a complete outsourced electrical estimating firm we've been in business since 2003 and we work for electrical contractors all over north america so no job is too small too large we do use the ebm program so we like using that and we also have it to be safe to be uh to be fair yeah we use almost all of them we use almost all of the programs out there we also have an electrical estimating training academy so it's an online uh program where you can learn how to estimate it's about a hundred hours worth of video training it's a learning management system where you're gonna go through modules you're gonna take quizzes you're gonna do homework assignments and it comes with our accompanying um book we wrote about a 500 page estimating book that goes along with the program so you can follow along and it's a great program if you want to learn how to estimate and do it right and uh you know it's great to to be part of the uh vision infosoft program today i want to thank everybody yeah and do you have anything else oh sorry linda i don't want to interrupt i'm good i'm good oh i was just going to say that when when mark and linda first told me about this class the on-demand and the community that they're creating uh it i i loved it because i i know that there is kind of a hole for that type of a service and they filled it and i know there's a there's a i don't know what the number is i don't know maybe you guys do but there aren't enough electrical estimators good electrical estimators maybe i could should add and your program helps grow that or eliminate that problem or at least reduce it so i i i would definitely recommend yeah i definitely recommend that you look that is our goal the department of labor and bureau statistics um has a study out there right now they're saying it's about 18 700 openings for electrical estimators nationwide in the united states so that's what they're seeing so there's a big cry for not only electricians but estimators there's a cry out there for all trades people so if you want to learn how to estimate you want to get out of the field maybe you're getting tired you want to come in um it's a great place to learn and so we look forward to having everybody you can always visit us at candles on call.com and uh go to our training tab and see the program so thank you all yeah are there any other questions uh i think the questions kind of slowed up a little bit um sonia asks how much that class is i don't want to point her to to the page on your website or do you want to discuss that a little uh yeah the there's um the it's on our website we have a program that starts off at 34.95 um to enroll in a program and um it's a great place to to start if you give us a call we can walk you through the platform and we can talk to you about uh some cost savings of enrollment in the program so uh it's all on our website and then feel free to call us at 877 candels and we'll take care of you there too all right and i'm kind of looking around and i think that covers all the questions but feel free to call either of us if you have any further questions and great awesome thank you everyone i think this one that we went really well today and i i'm really enjoying this platform uh with youtube live and be sure to subscribe to our channel here on youtube so that you can get notifications when we post new videos or we set up a new live all right all right thank you see you next time yep thanks"

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"VideoID": "786",

"Title": "Episode 34 - Construction vs Service and The Different TYPES of Electrical Work You Can Do",

"URL": "https://www.youtube.com/watch?v=74uD2\_Rtv8I",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] what's up my people this is Dustin Stelzer with another episode of journey to master and recently I got a comment and somebody was asking me what are the different types of electricians like they heard that there were some people that do industrial and some people that do construction and so I wanted to do something that just kind of lines out generally what kind of electricians are out there I'm not gonna hit everything every type of electrician but for the most part when somebody says I'm an electrician there's like six things that they're talking about there's of course guys that do like automotive wiring and marine wiring and people that do solar and stuff like that but they're not really electricians they just do things that are around electrical you know in the electrical segment but the actual types of electricians in Texas at least again there may be more in other states but in Texas there's a lot of different licensure you can even be in appliance appliance installer or you can be a sign electrician but I'm not even gonna cover those things because those aren't just like those aren't what I would call what we all think of as electricians so for an electrician there's really two main market segments and that's going to be construction or service so construction is obviously like constructive it's it's building things you know you're more of a craftsman you're taking nothing and you're wiring a whole bunch of stuff for your own pipe you're wiring a place so that it will be something Construction is you know like a new house is going up and so once the house is framed up you get in there start wiring things and then once all the sheetrock sup and everything like that you go and hang all the light fixtures that's pretty much the gist of construction the there's a bunch of different segments of you know like where you can do that but that is construction a lot of it is working with your hands being constructive having to have kind of an aesthetic eye and looking at things and trying to lay things out it doesn't require as much code knowledge I would say is being a service electrician but it's more building things and so that's why I say it's more constructive it's more like a craftsman really service on the other hand the general e-service electricians have to know a lot more about electrical theory and they're a lot more code knowledgeable because they're running across problems every day so service electrician is going to be somebody who walks into a situation where there's a problem it's an existing building an existing you know store or something it's not building anything new it's all just servicing equipment that air that's going wrong so like you know you can be working at a Walmart one day and Walmart all their lights are out and you have to go in and figure out why their lights aren't out and breakers blown up you got to come up with a breaker and replace it or somebody's house you know like something stopped working their dishwasher doesn't work anymore so you have to go in and fix it but it's two very very different segments of the industry both just as equally important and both have big-time pros big-time cons so within those two market segments construction and service you also have three sub segments basically residential commercial and industrial so you can do construction in industrial or you can do service in industrials so there's really like if you take the three and three there's really like six directions you could go as an electrician I think hitting all of them and trying to do all of them and gaining knowledge and all of them is going to make you much better you know a more well rounded electrician but some people find that like all they want to do is wire massive custom homes you know they like going into a multi-million dollar mansion on the lake somewhere and like having all this crazy design work and everything's flawless and there's lighting control and there's you know just crazy systems but everything has to be really neat and perfect there's some people that all they like doing is lighting control they like going out too in a service environment they like going out and fixing parking lot poles and getting up in a bucket truck and having to figure out why this you know bulb isn't working or whatever so that's more of a commercial thing like generally with residential residential is a lot of fun that's what I started doing I started doing small scale you know just wiring houses and then I got up to doing massive custom homes and that's really what we specialized in like the first four years I was an electrician I just did large-scale custom homes and it was cool as [ \_\_ ] man I like the constructive atmosphere I like you know like making everything really neat and laying out a room and thinking about the lighting and how the lights gonna hit the walls and thinking about the convenience of somebody actually living in that home and how to make it you know the most convenient forum with custom homes people have big budgets so a lot of things change all the time so you're constantly going in before the project is fully built and you're having to deal with a bunch of changes and a bunch of new things that that happen a lot so that's one kind of like frustrating thing about it but there are guys that all they do is residential construction commercial construction is a little bit different most of the time with commercial construction you're dealing with retail shops you're dealing with like mechanics they're going into shopping centers dentist offices businesses really so it's a little bit different than then residential the materials are different so you're dealing with you know different kinds of wire things are heavier dirtier you're cutting metal and trying to put things together that are metal so it's a little bit different in how you do everything the codes seem to be a little bit more lacs with commercial you know like in residential there's like so many different codes that you have to meet special kinds of breakers that you have to put in and certain circuits that have to have ground fault protection and things like that with commercial notes that's just lined out on the plan so when you're building when you're building a commercial building most things are already spec on a plan all the breakers are already lined out and everything so it's kind of easy just to flow and go and look at the plan residential things change a lot you run into you know things that you can't do or you can do or things that the engineer the architect forgot to put on the plan so you have to make sure that you still pass code to do it so that's just really the difference between commercial and residential a lot of guys that do commercial hate residential houses near residential hate commercial and the construction side at least the the commercial guys do a lot more with pipe and pulling wire through pipe and stuff like that it's just really the types of materials and how the work is done that's that's vastly different industrial constructions a lot different it's really it's like commercial construction and that you're dealing with you know big metal materials in you're having to do with rigid pipe and you're like hand threading pipe and things have to be very very precise still but you have a bunch of equipment that has to be lined out sometimes you have an assembly line and you have to expect these certain motors and transformers and then you've got motor control cabinets that you know all these different like relays and switches and stuff and all of them have these processes so that motor a will only work if motor B is working and if motor B is not working then motor a cannot work you know and so there's some logic and some programming and thinking about how everything has to work for a factory or a plant to work and a lot of times you're dealing with really really big equipment I mean like saws you know like 50 horsepower lifts and like just huge machinery and so if you get something wrong it can be pretty catastrophic and you can burn up a motor that costs like $20,000 you know so I think industrial construction is really cool it's a lot of its dirty work especially if you're doing like concrete plants and things like that but the kinds of stuff that you're doing just feel more important I guess you know like there's just a sense of like really having to get things right those are like the the three main categories within the construction field so now if you take those same three and you go into the service you know there's a residential service residential service is going into people's houses and figuring out why you know they're there panel keeps tripping a breaker every time they you know plug their space here and you know or plug seven space heaters in in one room but the it's dealing with having to go up in an attic and there's insulation in an attic and sometimes you got houses that were like wired in the 60s and 70s and the insulation is [ \_\_ ] old and you got like asbestos nasty fiberglass insulation or you're like going under a house if it's a pier and beam home so you're like in the wet and mud trying to you know do stuff so just the service work behind doing a residential service application can suck sometimes plus you're having to fish down walls and like depending on what height the ceilings are there could be fire blocking in the wall so you can't get a wire through without cutting sheetrock and nobody wants you to cut [ \_\_ ] sheetrock in their house you know but nobody wants to repaint a wall so you have to you have to kind of have a mind for how houses are built to do residential construction but it's you know it's still fun there's guys that's all they do and they know houses really well and they love working in houses next segment would be commercial service where you're talking about you know like going into Michael's or Hobby Lobby or Walmart or Jiffy Lube or dentist's office or something like that all of these places are existing they have customers in them and they want you to fix stuff so that they can continue to have customers in them a lot of what you do as a commercial service guy is go in and change bulbs and ballasts in places you know and like you go to a Hobby Lobby and there's like there's like 400 t8 lights up in the ceiling and there's like 15 of them that are just not working and then there's like 38 bulbs not working and so you just spend your whole day pushing a shopping cart around with light bulbs and ballasts and you're sitting there changing lights and ballasts there's a lot of that there's also things like you know their lighting control system will stop working their parking lot lights will stop and you got to figure out like why the control circuit is working the way that it's working and replace stuff with commercial service there's going to be a lot of 24 hour emergency work most of the service companies around that new commercial have some sort of 24 hour emergency thing and so when I was doing it I had a company phone and I'd get a call at 2 o'clock in the morning and have to figure out what to do with my kid that was a single dad but I had to like go drive two hours away to tell somebody that they had a [ \_\_ ] light switch over in the corner that they didn't realize they had and that's why their lights weren't on you know or sometimes it's pretty catastrophic you know like we've had like a 400 amp breaker just melt you know and just blow up and so like they call and you know the entire department stores down they've got all its food and produce and stuff and it's going to go bad within a certain amount of time so they bring all these like refrigeration trucks in and they start throwing all of their [ \_\_ ] meat and everything that can go bad into that thing to keep it cool and while you're there on site they want a [ \_\_ ] answer now you know like they want you to fix that problem which is cool because there's some supply houses to that offer that same 24 hour service for those guys you can call them and say hey man I need this really obscure [ \_\_ ] part can you make this happen right now and most of the times they will but it's just like it's a hurry up you know like like things are catastrophic and they need to be back up and going so that was really cool I actually did like like doing that stuff I got to go to some you know industrial places and things like that we're like a motor stopped working and we'd have to get a new one pretty quick because they're losing like millions of dollars in production where they're not getting all of their material out and then that brings us into the industrial service which industrial service there's some 24-hour stuff too not as much a lot of industrial places have electricians on-site or they have the same companies that they use over and over because those guys know you know the logic they know all of the VFDs and the PLC's they know the programming they know what's going on in these places but you know you sometimes you'll get called out to somewhere that it's a whole new thing so there's a lot of higher-level knowledge is what I call it that has to happen in an industrial environment I think industrial electricians are fantastic electricians because they just have to know so much about how all this stuff works and they they they deal with really expensive things and they have to know a lot of theory they have to know a lot of code and they have to keep really big [ \_\_ ] working all the time and it's not just like hey there's a motor boom and that's it it's like there's a motor that's controlled by another motor that generates power to this lift and there's all these different limit switches so that if product hits this thing and it's got to switch over to this line and you know like there's just there's a lot more to it and industrial is a lot of fun industrial service work I feel like between commercial and industrial service work I think some of the best electricians are produced out of those because they just come across so much [ \_\_ ] all the time the downside of being a service electrician is that every day is problems they were walking into a [ \_\_ ] up situation almost every single day you're having to figure out a solution to a problem some of the problems are really shitty and these people want this [ \_\_ ] fixed now and so it can be it can be some [ \_\_ ] sometimes most of the time with current with construction you're just doing the same thing and you know day in and day out you show up you do as much work as you can do in a day you're pumping you know you're like you're working fast whereas like service work you're working slow you know like you're really trying to diagnose a problem and figure out the smartest way to do this and but it's flip-flopped for both of those two you know like if you're in a massive custom home you don't want to necessarily be humping all the time sometimes you want to be like slow and methodical and think about where everything's going and do things extremely neat so when the guys come out to install all the devices like they have an easier time at their job and sometimes with service like you're gonna [ \_\_ ] hurry and you just got a bang [ \_\_ ] together but I think you know all six of those options are all options that every electrician should try to get into I think that if you know if you're gonna do this for a career why not get into all of it I mean I've messed with solar I've messed with you know automotive wiring like all of it really interests me but as far as like electrical doing this everyday I love construction and I love service I love both of them I like I'm an artist so I like the craftsman side of doing the construction I like you know dealing with lighting controls and you know putting an iPad on a wall and being able to dim your lights or take them you know pick your phone up and and giving somebody a new technology like that when they move into their house and be like all you got to do is take your phone and do this this this and this you know and your you can see your camera's outside I'll pick people up you know when they come up to the front door or you know if you're not at home and you're driving down the road you want to turn your heater on so that the house is hot when you're you get home you know like just cool [ \_\_ ] like that that's coming out in the residential construction side I still like sizing transformers and putting things up in commercial buildings you know working on 480 and 277 and I love all of it man I really love all of it so I guess choose wisely I've had some comments recently people have have said like which segment should I go into you know like I've been thinking about being an electrician but I don't know what companies I want to go to because these guys do residential but these guys do industrial service and I say just [ \_\_ ] pick one and go and work it for a few years and then pick another one and go or not you know you may just fall in love with what you're doing and you may have a boss that you would go to war for and he's a great person or she's a great person and you just want to stick with them that's cool too but there's so much out there man there's so much [ \_\_ ] to come across and I think to be a well-rounded electrician and be really really [ \_\_ ] good you got to do it all so that's my piece guys have a great day and I will see you in the next episode [Music]"

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"VideoID": "788",

"Title": "Commercial Electrical Project: Rock Dental Brands | Staley Electric",

"URL": "https://www.youtube.com/watch?v=LZB29ROYsUw",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] this is one of our commercial projects with heiko construction it used to be rock town distillery and they moved out and we did all the demo work and everything back in October and we came back in about January or February started running all the new conduit all new LED lighting we upgraded the service from 600 M service to an 800 M service this is phase one there's gonna be a phase two which is gonna be a coffee shop and a little grill area a little patio some of the things we're proud about about this project is all the exposed condo and everything everything has to be perfect our mission here at Staley Electric is to deliver quality electrical solutions and service in such a way that our customers refuse to use anyone else excellence and customer service is how we honor those we serve we make our customers smile cookie cutter and one size fits all doesn't work here we have a yes attitude we always find a way to win and we love doing it as stalee we trust each other we don't shoot each other we don't hide our problems we just solved this team did an awesome job on this project [Music]"

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"VideoID": "789",

"Title": "Understanding Electrical Risers in a Building: A Comprehensive Guide",

"URL": "https://www.youtube.com/watch?v=sJkzOLVRO60",

"Keyword": "Commercial electrical construction",

"Transcript": "hello and welcome back to our Channel today we have an exciting topic to discuss electrical risers in buildings have you ever wondered how electricity is distributed throughout a multi-story building well in this video we'll unravel the mystery behind electrical risers and their crucial role in building infrastructure so let's get started before we dive deeper into electrical risers let's first understand what they are an electrical Riser is a vertical conduit that carries electrical cables and wires connecting various floors or levels within a building in the electrical installations of apartment buildings vertical circuits are usually installed electrical risers which are part of the electrical distribution circuits and to which the floor distribution boards FDB are connected the final circuits of the electrical installation of the apartment I.E the electrical distribution circuits start from the fbd through which the consumer units are connected to the fbd the electrical risers in turn are connected to the main switch gear or main distribution Board of the electrical installation of the residential building and are used to supply power to the floor distribution boards electrical risers acts as a central hub for electrical distribution allowing power to flow seamlessly from the main electrical supply to different areas of the building essentially electrical risers ensure that electricity reaches every floor room and Outlet in a safe and efficient manner electrical risers serve as the backbone of a building's electrical system enabling the smooth operation of various electrical devices and systems they play a crucial role in delivering electricity to lighting fixtures HVAC systems elevators power outlets and other essential equipment present in modern buildings electrical Riser diagram an electrical Riser diagram is a schematic illustration of the electrical system of a building or facility showing the distribution of power and lighting circuits from the source of Supply to various loads and Equipment throughout the building the diagram typically begins at the main electrical service entrance and follows the distribution of circuits throughout the building showing the location and type of circuit breakers switches receptacles and lighting fixtures the electrical Riser diagram is an essential tool for Architects engineers and contractors in designing and installing electrical systems for new construction or renovations it provides a detailed overview of the building's electrical infrastructure allowing Engineers to plan the installation of electrical components and circuits and contractors to understand wiring and conduit placement requirements the electrical Riser diagram also serves as a reference for building owners maintenance personnel and electricians for future troubleshooting and repair of the electrical system electrical Riser requirements some of the key requirements for electrical risers include one fire resistance electrical risers must be constructed of materials that are fire resistant and able to withstand high temperatures this is particularly important in high-rise buildings where a fire could quickly spread through the Riser and cause extensive damage to accessibility electrical risers must be easily accessible for maintenance and repair purposes they should be located in a position that allows them to be easily accessed by authorized personnel and they should be designed with safety features such as locking doors to prevent unauthorized access 3. capacity electrical risers must be designed to accommodate the required electrical loads of the building this means that they must be large enough to accommodate the cables and conduits that will be installed in them and they must be designed to handle the maximum electrical loads that the building will require 4. separation electrical risers should be separated from other building systems such as HVAC ducts and plumbing to prevent interference and contamination this separation should be maintained throughout the entire height of the building five grounding earthing electrical risers must be properly grounded to prevent electrical shock hazards this requires the installation of a grounding system that is capable of safely dissipating any electrical currents that may flow through the Riser 6. Code Compliance electrical risers must comply with all applicable building codes and safety regulations this includes regulations related to fire safety electrical safety and accessibility and that wraps up our video on electrical risers we hope you found this information helpful and gained a better understanding of their significance in building infrastructure if you enjoyed this video don't forget to give it a thumbs up and subscribe to our channel for more informative content thanks for watching and we'll see you in the next video [Music]"

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"VideoID": "790",

"Title": "Fixing Up of Conduit Pipes on Roof | Plumbing and Electrical Contractor #shortsvideo #MrPerffect",

"URL": "https://www.youtube.com/watch?v=UtkEeKuE-bk",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music]"

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"VideoID": "792",

"Title": "What&#39;s the most important paperwork for Electrical Contractors when they want to hire employees?",

"URL": "https://www.youtube.com/watch?v=dbMBuF8AKXw",

"Keyword": "Commercial electrical construction",

"Transcript": "hey welcome back to the channel electrical contractors you know you've hit the number one channel for electrical contractors on YouTube I help you level up in the trade and as an electrician to become an electrical contractor look I've been blessed over the past 17 years owning my company in Los Angeles California now in Missoula Montana and being able to run this YouTube channel here in my studio in Missoula I want to talk about the most important paperwork that you can have once you establish your electrical contracting business you ready let's get into the video"

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"VideoID": "794",

"Title": "Best Electrical Estimating Software | How To Estimate Electrical Projects | Hybrid Pro Software 2023",

"URL": "https://www.youtube.com/watch?v=dLHCeWgni2s",

"Keyword": "Commercial electrical construction",

"Transcript": "good day I'm Pete here with software review and well I'm excited to show you today two electrical estimating software solutions for your estimating needs now the goal of this video it's simple it's just to show you a side-by-side comparison of two very different electrical estimating software packages each of these software packages works very differently so I'm going to be showing you the differences in this video just a bit of information about me if you're not familiar with me I've been estimating for years and I've used well most of every electrical estimating software on the market and I think what you're going to see here today in this video it's going to surprise you especially if you have the idea that the computer estimating work is hard the first software that we're going to review is a product that I've been using for over five years I do know my way around this software let's go ahead and get started I'm going to be entering just a few simple items in each of the software packages let's go under lighting we're going to install 10 fixture types each fixture will take 0.75 man hours to install the tags will be just a to J just to make it simple we're going to start by entering 10 A's 10 B's 10 C's 10 D's 10 E's 10 F's 10 G's 10 H's 10 eyes and 10js in the following video I'm going to show you the steps it takes to install the 10 light fixtures listed above in software package number one so let's begin select lighting enter the description which will be your lighting tag a through J enter the quantities for tag a go ahead and select F2 and then enter your man hours for this fixture go ahead and select ok now just repeat these steps nine more times and when you finish you will have entered the lights and quantities and then the man hours it takes to install each one of these fixtures and step number two next we're going to add one J box one cover three wire nuts per light fixture then we're going to include 10 feet of half inch GMT with three number 12 THHN conductors per fixture with the associated couplings connectors and straps in the up and coming video notice I did not really have any trouble adding the boxes covers and wire nuts because I created an assembly for each one of these items earlier but you do have to remember how to get back to those assemblies which is going to take several clicks now these are the steps it will take take off miscellaneous take off assemblies common assemblies common device now sort through about 90 plus items and then select box assembly this will take several steps to memorize but you can learn these and I'm sure in a very short amount of time next we're also going to add two thousandth half inch EMT with three number 12 THHN conductors dad these items we must go to take off Branch circuits take off and wire enter quantities set the attributes then select F2 in this video I'm going to show you the steps that I use to install the items mentioned above scroll down and find miscellaneous takeoff go through the steps as we talked about earlier until you find boxes enter quantities then ok now move to wire conduit Branch circuits change the attributes enter quantities then select F2 we're just going to add one more item to finish the review of software package number one now we're going to add 10 single pole switches with 10 boxes 10 plaster Rings 10 plates we're also going to add 10 feet of EMT Raceway to each switch to get above the ceiling now the steps to accomplish this is going to be as follows go to miscellaneous takeoff sort through 90 plus items find switch and plate enter quantity find box and plaster ring enter quantities miscellaneous take off all items conduit EMT standard select one half EMT enter quantity repeat the steps above to add to your couplings connectors and straps now in this video I'm going to show you the steps I use to enter the item mentioned above find miscellaneous takeoff choose through the list to find your switch and plate then enter your quantities choose through the list to find your box and plaster ring enter your quantities go back to miscellaneous take off sort through the tree for conduit choose EMT choose the size enter quantity ok now do the same for your fittings and your straps now we're going to review software package number two I've used many different electrical estimating software packages over the years and all well they all pretty much work just like the one we just reviewed now in this review I was given a different type of software package called best bid electrical estimating software I really was not expecting this software to be much different than the last eight that I've reviewed so let's give best bit a test run now I'm not going to address all the features bestbid offers such as the on-screen takeoff module and so on I just want to repeat the same functions that we just covered with software package number one on the bestbid software and see if there's any real difference between the two and if so what I'm going to start by entering the same 100 light fixtures 2 000 feet of Raceway conductors and then add 10 single pole switches please watch the following video to see these steps in this video we're going to install the lights the labor to install the lights boxes wire nuts covers raceways conductors couplings connectors straps Plus we're going to also install seismic hangers and screws the steps to create this will be select lighting new enter tags save that as it is after reviewing the software every week I'm hard to impress but I got to admit this was amazing and I think you're going to see how much easier faster and more accurate this product was than it was in the first package video everything was on one screen very few clicks and it covered everything now we're going to enter the switches boxes plaster Rings raceways conductors just like before plus the grounding stingers and screws the steps will be select switches new enter quantity save when you multiply this Simplicity and speed across the entire estimate I find the best bid electrical estimating software it wins hands down above all the other software that I've ever tested so here's what I found first there are far fewer steps which makes it at least five times faster simpler to learn fewer steps it's more detailed adds more products with much less effort the results can be 100 modified to include whatever your needs are and I found the prices better the most competitively priced software that I have ever looked at unlimited license free technical support lifetime updates one-time price for life they offer a complete line of electrical estimating and on-screen takeoff software Solutions all right my conclusion is best bid electrical estimating software easily wins The Challenge hands down you can go and find them online get more information from them direct it's www.bestbidestimating.com for more information that's all the time I have today and I hope you enjoyed this video my name is Pete software review guy thanks so much for watching"

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"VideoID": "795",

"Title": "First &amp; Second Fix Electrical | Solved by our experts or technicians #electrical #switches 2022",

"URL": "https://www.youtube.com/watch?v=ROCyAnscl18",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] you"

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"VideoID": "798",

"Title": "I&#39;m a broke electrical contractor and I don&#39;t know why? #electrician #electricalcontractor",

"URL": "https://www.youtube.com/watch?v=gbU6twopfmA",

"Keyword": "Commercial electrical construction",

"Transcript": "damn my guys got brought just bought a new car my employees did but I still can't buy a new car because you gave away your 400 nobody realizes that yeah when you see your employees driving better cars than you you gave away your money by giving the customer a discount okay does that make sense can we put that one on YouTube yeah let's do it let's do it all right so listen to YouTube when your employees are driving nicer cars than you it's because you gave your money away to the customer when they asked you for a discount"

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{

"VideoID": "801",

"Title": "Oliver Electric Construction",

"URL": "https://www.youtube.com/watch?v=w-kdnOyAosY",

"Keyword": "Commercial electrical construction",

"Transcript": "Oliver Electric in Lawrence performs electrical construction work we design install and maintain electrical systems the majority of our construction work is in commercial but we also excel in industrial and high-end residential projects we're unique in our dedication to Quality workmanship and we like to give more than is expected the advice I'd give some one in opening a business would be be as thorough as you can have a plan keep Good Records try to team up with a competent accountant and Banker now after working with the kbdc utilizing their many services would be part of my advice really there is no secret just honest hard work a commitment to Quality workmanship and honest business practices"

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"VideoID": "802",

"Title": "Making up Commercial Electrical Panels",

"URL": "https://www.youtube.com/watch?v=QCx67AADOyI",

"Keyword": "Commercial electrical construction",

"Transcript": "hey [Music] so [Music] you"

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"VideoID": "803",

"Title": "The &#39;Right&#39; Way to Price Electrical Work in 2023: Time &amp; Material vs Fixed Contract pricing~",

"URL": "https://www.youtube.com/watch?v=1L7\_OwEItWc",

"Keyword": "Commercial electrical construction",

"Transcript": "oh my what is up you crazy electricians and electrical contractors that's right you are tuning in to the 360 electrician podcast I am your host if this is the first time meeting my name is Jeff the 360 electrician and I've been electrical contractor for over 16 years and in the trade for she's since 1991. you figure that out and tell me how old I am but I started this podcast and the YouTube channel the 360 electrician to help you electricians level up and become electrical contractors and for electrical contractors that are listening out there to start making real money and live the lifestyle that you want to live how am I going to do that well you can take me as a little bit of an example I am currently coming to you live from our YouTube studios here in Missoula Montana just south and I run a mid-sized brick and mortar electrical contracting company that is busier than heck and it is always busier in the heck I don't rely on the economy uh for the past 16 years and so I decided to take my blessings I've been blessed God's blessed me in many many ways that I can live here in Montana and still run a business in California 1200 miles away I don't know if I just mentioned that or not and so I figured if I can do that I can probably help you spend more time with family do those things in life that you want to do and still being the greatest trade of all yep plumbers HVAC I'm sorry if you're tuning in but electricians are the best hands down all right well what are we talking about today you guys I'm not wasting your time at all I'm going to talk about something that really just pissed me off this week and I don't get pissed off very often I'm a very calm guy I'm very calm cool Collective because I'm blessed as I said and I feel like life is too short to be pissed off about the little things but you know what I'm gonna kick myself in the rear and if you were here I'd K I'd have you kick me as well I'm building a house here in Montana I don't know if you've seen some of the videos but I've been on my build and we're almost done we're a few months out and I did the unthinkable I did not practice what I preach I'm going to be honest with you I've told you that before you've seen this a couple of videos where I'm not practicing what I preach guys I hired someone to work on my house for time and material and it's a disaster oh my gosh if you're a contractor right now in 2023 and you want to be a successful contractor and keep your clients and get referrals stop charging for time and material I can't believe I did it but I did it I'm stuck tomorrow's the last day I'm done hey great guy don't get me wrong love the guy to death hate the fact that I hired him time and material okay so that's what we're talking about here are you gonna hire for time are you going to work sorry for time and material because I know a lot of you guys out there that are listening right now don't lie to yourselves and don't lie to me you're working time and material because of a couple of reasons number one you're scared you're scared you don't know if you're bidding correctly you don't know if you're going to lose money you don't know how you're going to get into this job and if you're gonna make money so you're scared and you figure if I charge time and material I can't lose well you might not lose on the job but I promise you you're going to be losing clients you're going to be losing future business and we'll get into that secondly you're charging time and material because it's easy you don't have to do any work you put the hours in you charge for the hours you bought 100 in material put 20 on it and get charged for the material easy cheesy what do they say nothing that comes easy is actually easy eventually it's going to cost you more because as I said I believe you're going to lose clients okay so let's talk about it you ready to dive in if you are hey if you're tuning in on YouTube on the YouTube podcast Channel which is at you go to YouTube Type in the search bar at the 360 electrician podcast and you're going to get this podcast with some video if you're tuning in on Spotify Apple podcast or Google welcome I encourage you to subscribe I thank you for it and I'm going to be honest with you if you're gonna get anything out of this podcast either on YouTube or any of the podcast stations and you don't subscribe give me a thumbs up and like just click off right now I'm not making any money by giving you this information the only thing I can get from you is a like or a subscribe and I appreciate it the more likes and subscribes I get the more I'm gonna ramble and give you all this knowledge in my brain to God willing help you with my experiences I'm not telling you what to do I'm not preaching like I know at all I am not the walking code book I am not the business Guru but I've got years and years of experience if you know anything about me and you know I would love to share it with you all right so let's get into it some pros and cons and I do have a video on this that I did a long time ago but it's fresh in my brain so I want to talk about it let's talk about the cons of time and material okay first and foremost your client does not know what it's going to cost him cost him or her at the end of the job why do I use the word cost I'm a big word user okay I like to use the word investment investment right here's the scenario if I come into a job and I say hey Mr Mrs Smith uh I can go ahead and come in and do this project I charge you 125 per hour plus parts and material plus 20 percent well the customer first thing they usually will ask you is well how long do you think it's going to take so hold up everybody write that in there if you're going to have to answer that question it's going to tie you into a time frame okay so what happens you start the job and you go and you go and you go and you're a new business owner right and the phone rings or you get a text message and what do you do the guy happens to be home he's watching you outside the the living room window putting in his porch electrical on time and material and every 15 minutes 20 minutes three hours four hours you're getting another business call because you're fresh you got that Angie's List call coming right you got that Yelp call coming right you got to pick that sucker up or you're going to lose that call well every time you pick up the phone or do that the client because I know that's what I've been doing that's why I can't believe I hired someone right now I'm looking at this guy going this guy better hurry up he's taking a cigarette break oh he just take the phone call he's took another phone call where the hell is he from lunch how much is this guy charging me how much did he how much how many hours did he work today do you see what's happening your customers are going to freak out 90 of them okay you know it and I know it I've been there I've done that I'm in it right now so this is Con what's the con about it the con is you can't just do what you want to do you don't have the freedom to take up those business calls that you can't afford to lose you can't afford to go out to the truck get your clipboard or your notepad or your laptop and send out an email to either your other guys or your estimate for that job because the other client said if I don't get the estimate today you can't get the job so now you're taking a break from this guy's job that you're on time and material and you're doing other business it's not fair to the client what's going to end up happening is no matter how much he smiles or she smiles no matter how much they thank you they will never call you back if they don't have to they don't like you because they feel like they got ripped off now there's some ways to save that you could say at the end of the job hey Mr and Mrs Smith we did the job hey I'm in it for 27 hours but I'm going to go ahead and credit you for three hours because I was on the phone and I had some other things that I had to do and I don't think that's fair to build you for those three hours sure that'll make up for it but it's not going to be good as charging a fixed contract price and that is the way you should be pricing in 2023. if you're tuning in from California don't quote me because I keep saying I'm going to look it up but I'm pretty darn sure that is it is illegal now for you to charge time and material to residential customers you must give them a fixed contract price now that's California I know it's probably not anywhere else and again check me go to the contractor State License Board and check it but I'm pretty sure that's the way it is now I don't care because in my brick and mortar we only charged fixed contract pricing and that's it for everything okay the benefits of fixed contract pricing hey Mr and Mrs Smith I went ahead and listened to the words I'm using okay and a lot of you don't comment don't comment and say oh you're bsing you're full of this and you're you're just a Salesman today dude I am in business to make money okay and if I can make money listen that's not the only thing though I should be careful when I say money like it's the most important thing no my clients are the most important thing so making money probably comes secondary to keeping my client happy because you're not going to make any money eventually if you don't have happy clients so money is the important part meaning I want to be in the black okay I'm not talking about oh I better make that money and start ripping people off because we don't do that I'll charge you the same if you make a thousand dollar a year income or a hundred thousand dollar income you've seen my videos where I'm working in multi-multi-million dollar mansions and sometime I'm working at Joe blow's house in his trailer I started in a trailer right double wide baby if you're with me like hit that subscribe no I'm just kidding but listen I did starting a double win I don't charge differently when I see a Ferrari in the driveway or if I see a Hyundai in the driveway I'm in business my business is modeled almost like a McDonald's what do I mean by that when you go to get a Big Mac from this McDonald's it's 5.78 cents I don't know what it is but I'm just saying when you go to a McDonald another McDonald's it might vary by five or ten cents because it's the city and the state and tax but you're not getting a seven dollar Big Mac right and then you go out of state even to a different state and it's not like it's a 12 Big Mac I want to stay consistent okay consistency is super important and and therefore when I charge a fixed contract price it's based on my daily labor rates so then when I go into a client and say hey Mr Mrs Smith I can go ahead and do this kitchen remodel it'll it'll take a couple of days I don't tell them time and material I don't want to take him I don't want to tell them it takes one day I don't want to tell him it takes three days because then I'm putting myself again into that loophole right I'm putting myself in a corner where I have to perform in a certain time frame I said this is a multi-day project and your total investment is going to be 3980 guys I took my daily labor rate times two and a half days I'm taking my material not plus 20 but plus a dollar amount if it's 700 in material I'm rounding it up to a thousand dollars that's more than twenty percent that might be forty percent I don't know I'm not doing the math in my brain right now I'm giving a fixed contract price and now guess what I know that this is a two and a half day job because I have the experience to know that and the customer knows that at the end of the job it's going to be a three thousand eight hundred ninety dollar project done deal now I can call it an investment because it's a fixed amount and it sounds better than saying hey you're going to have to pay me or it's going to cost you or any of those bad words and I say it's a fixed contract price your total Investments can be 3 890 we're going to go ahead and do this and do that and that tell them everything that you're going to do I'm going to give you a one-year full Parts labor warranty if anything goes wrong I don't care if it's a manufacturer's fault I'm going to take care of it for you in the first year if you go ahead and okay my paperwork we can get started for you right away these are sales techniques the way you want to go is fixed contract pricing you know what you're getting paid at the end of the job they know what they're going to pay at the end of the job they're super happy and they're ready to refer you how are they going to refer you yeah here it is again you're going to do my marketing course at www.the360electrician.com and you're going to make three clients into nine you're gonna make nine into 27 and so on and so forth okay fix contract pricing is the way to go how do you get your fixed contract price how do you know your daily labor rate well there's five line items I teach you in coaching again you can sign up for coaching at the website too www.360electrician.com you're going to get your five basic costs and you're gonna repeat one every single thing to run your business is included in that five line items that I want to teach you okay that includes if you have payroll that includes your workman's comp that includes your insurance that includes your attrition do you know what attrition is in electrical contracting here's the biggest problem I found when people coach you know what Jeff I'm just not making money any money and I don't understand well how much do you charge an hour I charge 95 an hour I go great why do you think you're you're losing money I don't know he goes I just I just started as a contractor I've been doing it for five years but everybody else here charges 95 that's the going rate who cares what everybody else's rate is it's everybody else's overhead and expense is yours no they're not second thing well I don't know why I'm not making any money because I used to work for 35 an hour and I'm on charging 95 on my own and I can't make it hell yeah you can't make it because after I go over the five step line items we repeat the once or the sixth you find out that you should be charging 120 an hour and you realize this whole time you've been working for free because in my system of pricing my five line items right the only two suckers in there are your business and you as the owner everybody else has to get paid or you can't have a business the only people the only entities Pockets or the person's Pockets you can take money out of when you when you're losing 20 an hour is either you the owner or you your business okay I want to teach you all that so I encourage you if you're an electrical contractor and you're not making a ton of money and you need help or you're an electrician and you're going to get into trading and you don't know what to do get coaching I'm gonna teach you all of that stuff okay so listen I've wrapped it up I mean I told you my experience that's what this podcast was about I don't I I didn't get into too much detail I'm not going to go past the 15 minute mark on this one but listen in 2023 you need to start charging fixed contract pricing go to YouTube and type in fixed contract pricing versus hourly start educating yourself for it and when you want to tie it into the electrical contractor trade you know you might hear it from a plumber hvc but it's different from an electrician and and you want to know about the the two or three reasons there's actually four reasons why someone's gonna say no to you let's just say you give them a fixed contract price hey Mr and Mrs Smith uh your total is 3890 and they say no it's one of four reasons they're going to say no to you and I want to teach you those four reasons okay maybe we'll talk in another podcast that's it for now I hope you subscribe I hope you got something out of this podcast and we will see you on YouTube Tick Tock Instagram and we will see you here on the next one take care and God bless"

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"VideoID": "804",

"Title": "Electrical Construction",

"URL": "https://www.youtube.com/watch?v=RBoGa096MbA",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] [Applause] our electrical construction program prepares students to install operate maintain and repair electrically energized residential commercial and industrial systems and dc and ac motors controls and electric distribution panels curriculum and instruction emphasizes practical application of mathematics science circuit diagrams and use of electrical codes and includes blueprint reading sketching and other subjects essential for employment in the electrical occupations reading and interpretation of commercial and residential construction wiring codes and specifications installation and maintenance of wiring service and distribution networks within large construction complexes are also critical components of the program graduates will be able to pursue a range of career options from becoming a line worker residential or commercial electrician telecommunications and an industrial electrician you can learn all the basics of these electrical fields in steel center's electrical construction program according to the u.s news and world report the electrician career field is the number four in the highest paying job without a degree the number 16 and best job without a college degree and is number 92 out of 100 best jobs in america the reason i picked electrical construction is because i already had a really big interest in electricity since i was really young electrical instruction from all the research that i did and asking people that were already here talk to me about how intricate everything is i heard it's a really serious class and it's really it's really challenging class but it's really nice in the end because you have so much more knowledge in some other class that might not be as challenging this is in major demand as as opposed to just going to college and getting some sort of four-year degree which i think everyone is doing now pretty much and if you don't end up becoming an electrician it'll give you skills you can have for the rest of your life even just as a even if you do something else you always know hey i can this is wrong for my outlet i don't know how to fix it stuff like that it will give you basic skills to use for the rest of your life"

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"VideoID": "805",

"Title": "Johnson College - Electrical Construction &amp; Maintenance Technology",

"URL": "https://www.youtube.com/watch?v=wAZly\_yySdI",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] what makes our program special i feel is a combination of johnson college and the people at the helm both me and my fellow instructors are extraordinarily passionate about this college and about this trade it's safety first safety last and safety everywhere in between and we feel it makes us stand out apart from the rest this trade will never go out of style it's ever evolving and ever changing we're constantly getting more efficient and more diverse it's a great time to get into trades there's a huge uh there's a huge labor gap and a huge wage gap really never better time to get in another advantage this program is strong industry ties you receive a wide variety of training throughout multiple locations in the area upon graduating this program you'll receive an associate's degree of applied science also you'll receive osha training upon graduation you can receive jobs in residential commercial and industrial applications if you have a passion with working with your hands and like producing high quality work this program is going to be perfect for [Music] you"

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"VideoID": "806",

"Title": "electrician #shorts#conduit#Electrical workers#woman electrician#electrical hazards",

"URL": "https://www.youtube.com/watch?v=GYGuJPc1YOk",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] that's what we do out here [Music] on the daily"

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{

"VideoID": "808",

"Title": "Commercial/Industrial Electrical Apprenticeship",

"URL": "https://www.youtube.com/watch?v=R4wdcUA8NdE",

"Keyword": "Commercial electrical construction",

"Transcript": "construction sites we see them all around us and although the end result of the work is always quite different there are the usual similarities to the untrained eye stacks of material waiting to be assembled or installed in the proper place the cranes that will put them there tools that bring the task down to a more intimate individual level of man and machine repeated thousands of times every day but the thing that every workplace has in common regardless of what it will become is shared risk the financial risk of the owner when it comes to picking the right people to do the job do-overs are not an option productivity aspera mount knowledge is power at the end of the day it comes down to this who are those people under those hard hats who is actually doing the work are they all pros are also rands what skills and attitude do they bring to the table every day see it's what's going on in the minds under those hard hats that is exactly the nikah IBEW empowering America team difference we're the most skilled and productive safest power professionals in the world and it all starts here at our electrical training Alliance facilities all across this country with the solar photovoltaic process these modules convert sunlight into DC power which is then inverted into AC power for electrical distribution this control panel is the brains of a production line at a manufacturing facility I used to play video games now I work on the instrumentation and automation for industrial process controls I work on the computer systems that control traffic intercity I am about to supply the power they'll run this high-rise apartment building on any given day I could be programming VFDs or updating safety sensors the Titan machine tolerances and I'm upgrading the conveyor belt monitoring system to make sure you and your bag arrive at the same place founded in 1941 the electrical training Alliance is the backbone of the powering America teams industry leadership each and every year our Nika contractors and IBEW Local spend two hundred million dollars nationally to train our men and women not just the how but the why of electrical and communication systems that power our world when their training is complete they not only can lead crews on the job they're leaders of the industry that's because there's nowhere else where a worker can under one roof learn an electrical Theory conduit bending for grant will be logic controllers motor controls fire alarm fiber optics local area networking arc flash protection the list goes on and on and it keeps growing because we have been embracing innovation for more than 125 years it's an always advancing process because electricity power and information systems are always advancing industries you'll find our men and women plying their trade wherever there's a need for power from industrial to commercial to data centers and smart buildings to alternative and green energy systems we invest so heavily in our training because we are well aware that our customers and owners are investing heavily in their own projects and we don't want to let them down ours is a changing challenging technical industry that we've chosen as our way of life but for our customers it still comes down to this the key to a job well done is having people on it who know what they're doing it's really as simple as that we are we are you [Music]"

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"VideoID": "809",

"Title": "Reading an electrical plan &#39;scale&#39;",

"URL": "https://www.youtube.com/watch?v=JJLA5hUy4OI",

"Keyword": "Commercial electrical construction",

"Transcript": "on every set of plans on each individual plan sheet don't make the assumption that everything is the same measurements now every single drawing somewhere on it is going to say what the size is does it matter yes Size Matters in this case size does matter all right this is the electrical plan and see it has a scale so you look at that it says scale and that's says quarter equals and then some other gibberish so what does that tell me that tells me they meaning a/4 in equals one and the little line above it means 1ot Dash Z and the two lines are mean inches so whenever you see something like that you can read that4 in equal 1 ft0 in simple enough right you wouldn't want to read that say4 in equals 10 in because that's wrong or if you had a two there that would be 1T 2 in not 12 in you do something like that and you're already messed up before you even start all right Joe qu inch equals 1 foot exactly what does that mean well you get your tape measure out we're going to measure this this is where the toilet's going to be okay that's called a water closet is what most toilets are called and we're going to look at this and here's the wall inside to inside okay we're going to put our tape measure there and I can I just usually started on an inch in perit I could start it at one or I can put it at two or wherever okay so just follow this out okay so I'm right at two and see where I'm at I'm a 16th of an inch that's why you got to know how to read your tape measure I've got some videos for that so see we're an inch and a 16th and every quarter inch we know is a foot right so/ qu inch that's one foot 2 feet 3T 4T and that 16th measurement if you know a/4 inch is a foot then every 16th should be 3 in 3 6 9 12 3 6 9 12 you see what I mean so if you look at that and your electrical plant says qu in equal 1T 0 in we know this room between this wall and that wall is what four 4T 3 in if that's what your answer was give yourself a gold star wasn't that cool now your measurements might not always be/ qu in equals 1T okay this one just so happens to be/ qu inch equal 1T I've seen plans an eighth of an inch equal 1 foot or 316 equals 1T so it's very important to note that now why would that matter when you're doing electrical cuz all these walls are already going to be up they're all going to be built and everything so what difference does it make you might say well let's see if it does make a difference let's take this wall for example let's say you're going to install these receptacles we know that's a duplex receptacle that's one that's one that's one and this is this is a TV location right there okay and are you just going to throw those up willy-nilly no you can take your your tape measure out okay like that let's hold hold that up there I'm just going to kind of line that up with the door I've got to mark it somewhere okay so I can start right there so I know from the edge of that door opening over to the first receptacle is how far is 4T right and then this one's at 3 ft o further so 4 feet 7 feet 8 N 9 ft over and another 4 feet over to that from there okay so you go on the wall you look where the where the uh the studs are whatever and then you mark out your plugs accordingly and that's where you're going to lay those out you're going to install those those uh wall outlet boxes so I guess it does make a difference"

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"VideoID": "812",

"Title": "Electrical Construction and Control | Northeast Community College",

"URL": "https://www.youtube.com/watch?v=N7m0PEhASno",

"Keyword": "Commercial electrical construction",

"Transcript": "I get a build something with my hands looking at your projects when you get done you get to work with all different kinds of people in this line of work it's never just the same monotonous thing every day physical aspect of being the electrical construction program electrical construction and control because we do get into a lot of control systems it's a grouping of all the basic electrical noise that you would need to become an entry-level electrician [Music] I think the electrician career at the suggestion of my high school shop teacher he told me that there's a lot of potential in that upcoming years in that particular field and with with Northeast being here at home it was it was a no-brainer students can expect to move into a multitude of careers outside of the residential in the commercial industries it's what I've always liked about the electrical field there's a lot of different areas you can be employed in from the residential sector to commercial to industrial light or heavy industry and in agriculture and there's always service work be done it's not going to break your bank when you graduate after graduating I feel like I've been very successful or at my current employer I've started on ground level and I've worked my way up into management and I am in charge of my own department [Music] favorite project I've done is the green bin project I missed a lot with control wiring wiring up a PLC it was greatly a challenge and I loved it I have to be the conveyor worked with a forward reversing Kaveri with PLC and that was a lot of fun I can't just pick one because they're all they just all lend themselves to nurturing your growth in this field I would recommend northeast to somebody looking into this career be patient just keep an open mind be ready to continue to learn the sky's the limit if you graduate with a degree in this program [Music] you"

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{

"VideoID": "813",

"Title": "So much wiring! #shorts #electrical #dreamhome",

"URL": "https://www.youtube.com/watch?v=moT-Mqy4lTE",

"Keyword": "Commercial electrical construction",

"Transcript": "foreign [Music]"

},

{

"VideoID": "816",

"Title": "domestic electrical installation",

"URL": "https://www.youtube.com/watch?v=2GwBN5jiOBE",

"Keyword": "Commercial electrical construction",

"Transcript": "foreign"

},

{

"VideoID": "817",

"Title": "🆕Commercial Electrician Services In Lynnwood Construction Electrician In Lynnwood Check It Out!",

"URL": "https://www.youtube.com/watch?v=lHDU4XEg\_JI",

"Keyword": "Commercial electrical construction",

"Transcript": "the best commercial electrician services are you a general commercial contractor looking for the best commercial electrician services in washington if so you have come to the right place system solutions of washington llc is your premier commercial electrical service provider in washington we are a full service commercial electrical company that delivers high quality code compliant expertise for all electrical needs of commercial building contractors in the area whether you want to add a new circuit to an office building a new electrical box or wiring up commercial equipment with power we are your best choice in washington our expert team can review and fix any code violations and offer surge protection solutions for your commercial facility in fact code compliance is important to guarantee the safety of the inhabitants in the building system solutions knows the code in your city and county here is why you need to rely on system solutions when you're looking for the best commercial electrician services in washington system solutions for all your commercial building projects system solutions is a leading provider of high quality commercial electrical services at affordable prices our main goal is to create a successful partnership with commercial building contractors in washington in its suburbs our customer service department strives to achieve excellent customer relationships and attract repeat clients through the highest quality production standards professionalism and reasonable pricing we are a full-service commercial electrical company fully insured bonded and licensed to serve all commercial building contractors in washington and its suburbs our electricians are knowledgeable skilled and trained to meet all your commercial electrical needs our dependable staff will provide comprehensive project management from start to finish our expert team brings over 150 years of combined experience to the table we handle all types of commercial electrical projects no matter the size of the project in fact no electrical project is too big or small for our expert team the services we provide electrical remodeling most commercial remodeling projects need the service of a commercial electrician to handle the electrical work we provide quality commercial electrical services to all commercial building owners commercial remodelers project managers and investors whether you are planning to remodel an old commercial building or a historical building in washington our experts have the commitment and skills to handle your project security lighting every commercial building needs good security lighting all occupants of the building need good light to work safely we are experienced and have all the tools to deal with any type of project we offer a complete security lighting solution to your commercial property whether you need security lighting repairs replacements installations or upgrades intercom wiring our expert team is up to date with the latest technology in the industry since we have completed a lot of commercial intercom wiring work over the years call our contractors for a quotation when you need intercom wiring repairs or installation of cat5 systems call system solutions of washington llc right now for all your commercial electrical needs in washington and its suburbs the best commercial electricity"

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{

"VideoID": "820",

"Title": "GPE Electrical Services - Residential and Commercial electrical, upgrades, remodeling, and repairs.",

"URL": "https://www.youtube.com/watch?v=uN2G0-nxTkg",

"Keyword": "Commercial electrical construction",

"Transcript": "we're a full-service electrical company we can come up to your home and do anything from putting in lights cameras also clothes to electrical panels and different things like that we can do anything from your parking lot lights we have maintenance contracts with different companies to change our lights inside their buildings we can change our walls we can move clothes whatever you needed to do we have what it takes books good quality job for a good affordable price it's good to catch a lot of things before they happen because after they do it is too late your electrical panel should be checked every three to four years if you haven't had your electrical panel serviced in the past five to seven years it's time to have somebody take a look at it we want to make sure that everything is electrically safe and we don't take shortcuts we want to make sure that we give a client a good product for an affordable price and that is safe for them to live in their homes or operating their business we serve the whole Houston metro place contacted on our website call us at two eight one two nine nine nine six six four [Music]"

},

{

"VideoID": "823",

"Title": "Commercial Inspection Overview of Electrical",

"URL": "https://www.youtube.com/watch?v=GgWSmkZp2Ec",

"Keyword": "Commercial electrical construction",

"Transcript": "hello my name is Dan McCarthy I'm going to facilitate the commercial inspection training electrical portion of these videos that you're about to see in talking about these videos there's a couple things I want to go over with you number one this training course is to become a facilitator you are going to be the person that coordinates the inspection you're going to need to have a third party or a commercial company come in and do the inspection on different materials and equipment and components and things like that that's there that you don't have the expertise to to talk about start off with an Ansel system a cable tray switch gear contactor a generator these are things that you will come across depending upon the condition of your commercial property you've got a Transformer basically a gray box they could be as big as a semi truck trailer or as small as two foot by three foot these are also not to become a code inspector I am a code inspector I'm ICC certified in commercial structural inspector and ICC certified and commercial electrical inspector I've been a commercial electrician for 18 years you don't want to be in the position I am you want to do what I do so you want to hire someone like me to do the inspection that knows the equipment and how it's installed what it is how many phases three phase what what the torque value is on the switch gear for instance how many pounds per square inch it must be torqued to what type of light it is whether it's Mercury halide sodium vapor you want to have someone that knows what they're doing what they're looking at what your particular commercial property is you want someone with that background and knowledge that's an expert in that area you're going to take all the notes you're going to take all the pictures you're going to do a report whoever hires you to do this inspection you're going to give them a report on their commercial property you may need to have third-party inspectors to do your electrical if it's a large big warehouse for instance with 480 three-phase Transformers switch gears motor control centers dangers in the commercial electrical and inspections is that they are much different than residentials there are more voltage and amperage used therefore increasing the danger but the smaller properties like a mom-and-pop pizza place or a little flower shop in a strip mall things like that you may feel confident enough to do them yourselves there's not a lot of difference between that commercial inspection and a large residential home you will not want to open any of these high voltage panels you will not want to open a Transformer you will not want to do any of these things leave that to the third party qualified certified experts to do that and they will give you a report that you add into your report you will coordinate all these different inspectors and different companies and third-party people to help you with your inspection as a facilitator you will do all the record keeping you will coordinate when they come but you need to know what the items that they're talking about are and that's what a large portion of our video is going to tell you is what these things are that you've never heard of or seen before so you'll have the background of what you need to say in your report so it's very important that you have all these all this information organized in an orderly manner for the report you need to understand and be familiar with these items you need to locate and document the condition of different components and equipment and this course will help you do that so you can talk to your third party experts and companies so thank you very much Dan McCarthy let's get started with our course"

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"VideoID": "826",

"Title": "Electrical Panel Upgrade in San Jose, California -What Need To Show To FUSE advisor",

"URL": "https://www.youtube.com/watch?v=OyFp\_Nil9-4",

"Keyword": "Commercial electrical construction",

"Transcript": "mainly today's electrification projects require new better electric panels we need to make sure that the new panel that we can install will be possible at the location in order to do so we usually have to take several photos and several measurements make a photo of the meter we need to open the panel take the photo of all of these labels here take the foot of all the breakers measure the distance between the window the panel The Edge to take a photo of the hole wire going to the electric pole with all the proper information it will be easier to obtain the permit to apply with the city and to speed up your approval some of the older panels are safe to Hazard it's very important to replace them in order to prevent the risk of fires and any other problems also on the numer panels you can connect many things like EV Chargers heat pump heat pump water heaters solar panels and so on"

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"VideoID": "827",

"Title": "Electrical Apprentices Can Thrive in Barts Electric Culture",

"URL": "https://www.youtube.com/watch?v=0npXi6ymf0U",

"Keyword": "Commercial electrical construction",

"Transcript": "everyone telling me to come work from if I ever wanted to when I was working for another company and he was just like you ever want to come electrician just come down to Bart's electric and so ended up here and loved every bit of it ever since honestly a great community and everyone is well-rounded around here I've learned how to make conduit learned how to pull wire learn how to do uh receptacles my goal is to be able to provide uh for my community and build a career and expand my assets and my learning"

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"VideoID": "829",

"Title": "These boots provide a crucial barrier between the electrical wires and the elements.",

"URL": "https://www.youtube.com/watch?v=ox03PslKWpM",

"Keyword": "Commercial electrical construction",

"Transcript": "it's your favorite inspector here on a roof I feel like I'm always on the roof talking about problems to y'all that should let you know just how common roof problems are this time I got a little Silent Assassin leaky leak for you this is the electrical for the house that comes in from over there comes over to the service Mast goes down through the roof to the main electrical panel below now where these two pieces intercept there should be a rubber boot right there that prevents water from dripping down below looks a lot like this rubber boot speeches"

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{

"VideoID": "830",

"Title": "How to Open a Successful Electrical Shop Business With Small Investment",

"URL": "https://www.youtube.com/watch?v=RHrdsjXdxDI",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] hair friends welcome to new business ideas today we look in the business how to open a successful electrical shop business the business of electrical shop is considered to be a business in which there is continuous growth in the business as well as profit the business of electrical shop is very beneficial in india the profit margin is also good in this business opening an electrical shop can be a very profitable deal in this present era because all those things come under this category which is sold every day and its demand is never ending also the list of electrical goods is also long and their customers also keep coming in the market today the business of electrical in india is continuously developing india if you've ever wondered how to run a successful electrical business or are looking for effective electrical shop business ideas running an electrical business can be one of the best moves of your career if you have a lot of experience in this business so opening electrical shop business in this present era and you can make good profits here in this video we are providing all the information about how to open a successful electrical shop business in small investment market demand for electrical shop business everyone knows that electrical things have an important part in our life and to make our work easier electrical things are available in a lot of markets electrical wire switchboard socket plug holder cfl and led lights tube lights fans and other things are part of electrical goods and their list is so long that new electrical things are coming in the market to make our life easier day by day the business of electrical industry in india is also gaining momentum in 2019 the business of electrical industry in india was 76 400 crores which will be one lakh 48 000 crores by 2025. the largest number of electrical things are made in india too the share of electrical business in india's gdp is 2 it shows that electrical goods have great importance in our life so running an electrical shop can be one of the most beneficial career moves you can ever make if you own significant expertise in this business hold a list of faithful clients and fully understand ways to comply with government regulations space for electrical shop business the initial thing that you should do if you wish to open an electrical shop is to look for a suitable location also to get a better client base you should always choose a prime location that holds a high customer base and fewer competitors according to the market you need 100 to 200 square feet of space before starting electrical shop business it is necessary to have and if you start this business in your place near any mall market high traffic area and any main road then it can be very beneficial for your business too and picking a prime location for your electrical shop will ensure that you earn better profits and always remain ahead of your competitors investment for electrical shop business the investment is depending on your business size and type for this you have to think about your business and how many electrical products you will sell because the price of the products of all the companies is different generally you can start an electrical shop on a small scale with an investment of 5 to 10 lakhs rupees and this investment can increase even more for you want to sell the big brand goods then the investment will have to be more so before planning for other operations of your electrical shop always ensure to check your financial position license and permits for electrical shop business you need to obtain various license and permits to run an electrical shop business and the license to open an electrical shop varies from state to state you need to obtain the proper license permits and insurance to work in your area for this visit your city's municipal office and know your eligibility for getting a license ask them about all the license and permits required to run an electrical business and try to obtain them and also contact a few business insurance companies as well to obtain business insurance codes where to buy goods for electrical shop business when you set up an electrical shop in a big city then there is already the headquarters of the companies manufacturing big electrical items or there are distributors of these companies who supply those goods in your area or the whole city in such a situation those people themselves will come to your shop and after talking to you they will provide you with all the goods at the right price and if you are from the village then you can contact yourself and talk to these distributors by giving information about the location of your shop and they will then send the goods to your shop as soon as you place the order sitting in the shop and also you can search on google for the good companies whose products you want at a wholesale price inside your city or district decide the services you want to provide at electrical shop to make your electrical shop in the market you should give different types of facilities to the customer at the shop you have to do digital payment like phone pay google pay and other cashless facilities in your shop because most of the people use these things for payment to keep the customer happy you can also give them some discount along with the products and most importantly whatever customer pays you all the payments immediately you should also give them the facility like cashback so the name of your shop comes up quickly in the market and people will like to come to your shop marketing for electrical shop business marketing is an important part of any business so you can market it as well electrical stores expect most of the local customers therefore advertising for an electrical business can be done in one of several ways including billboards yellow pages ads flyers and email marketing to existing customer lists so your identity is made quickly in the market also to make a quick identity you can distribute it by printing a pamphlet with the newspaper or you can also create an account on all the popular social media platforms and keep uploading photos and videos daily profits in electrical shop business electrical goods are a high demanding product the demand for the product remains in the market you can take a profit margin of up to 20 from the product in this business and all the profit depends on your selling further talking about profits in an electrical shop if your shop is in the city then you can earn 5 000 to 10 000 rupees per day and you can easily earn one lakh rupees per month and if you are a big wholesaler shop then you can easily earn 20 to 25 000 per day from the electrical shop business and sometimes more construction work is going on in the village then even the electrical traders of the village can earn as much as the city final thoughts of the business if you're an experienced electrician and you know there's a demand for an electrical shop in your area starting an electrical business on your own as smart whatever name you choose for your electrical shop make sure it has a good recall value so people can easily remember its name whenever they need services you should consider whether you will need other employees to run your electrical shop initially you won't need any helpers but you will need more employees as the business grows also while running an electrical business involves a lot of attention it has its freedom as well you can work in the hours you want you can run your business the way you want and can earn as much money as possible we hope in this electrical shop business video will help you in initiating your own business if you like in this video please like and comment and if you enjoyed this video share it with your friends thanks for watching friends for more business ideas find in our channel video playlist and subscribe to new business ideas [Music]"

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"VideoID": "831",

"Title": "University of Nebraska Omaha - Code of Excellence in Electrical Construction, NECA/IBEW Team",

"URL": "https://www.youtube.com/watch?v=vvYxMUPREVQ",

"Keyword": "Commercial electrical construction",

"Transcript": "thank you as end users when you start a project you purchase electrical equipment just as much as you purchase those who install it the Nika IBEW team recognizes the gravity of the situation you face and so as not to cheapen your choice but to call attention to it we've come up with a program whereby each and every Craftsman and woman puts to Ink common core values to abide by and live up to every minute they're on and off the clock it's called the code of excellence and it's your guarantee that when you choose us you choose the very best we went to Omaha Nebraska where more than 800 IBEW members have gone through a new code of Excellence training class to see how it's working out for Nika the IBEW and most importantly you the end user for as long as the IBEW has existed there have been core values each member holds deer and when it comes right down to it it means IBEW members hold themselves up to a higher standard than their non-union counterparts the code of Excellence an ongoing program developed by the IBEW and endorsed by their Nika contractors it's a way to codify the things that IBEW Craftsmen have always done simply it gives customers Peace of Mind knowing that they can expect certain things on each and every code of Excellence job each IBEW member to perform their work safely and productively they'll show up on time they'll work hard through until break time they'll not use cell phones unless they're on break the break will fill up the allotted time and not a minute more they'll give an honest eight hours of work for eight hours of pay the code is a living and breathing document seen through our electricians witnessed by management and evident to those writing the checks we have an effective program that we're proud of which we feel like we we have at the present time it's delivering on our promise to the customers if we're selling something at the front end of the job and we're not delivering it at the back end of the job we're doing a disservice to the customer it's that kind of that old school work ethic and I will tell you I have not had that experience in other jobs a recent example of a job done under the code of Excellence is Mammal Hall on the campus of the University of Nebraska Omaha the job is a three-story 120 000 square foot building that will host a thousand students per day and features interactive touch screens a massive 196 seat Auditorium and lead certification thanks to the many Technologies installed by the Nika IBEW team the 27.6 million dollar facility had state-of-the-art Energy savings installed custom including UV lights installed in the chilled water coil providing clean air to the building 24 hours a day temperature and carbon dioxide sensors in each office that control the amount of outside air serving each part of the building and sensors and lot diffusers allowing for manual control I'd do it as I'd wanted in my house you know and I'm pretty particular everything in Mammal Hall is also centrally controlled allowing for everything to be managed in a cost efficient manner the code of Excellence has been a big part of the electrical install at the site and at other sites around Omaha people are talking about it and not only electricians but building owners and developers as well with this job you know I know what's going on all the time because of communication my personal opinion of the code of Excellence is that it's successful because it has started a dialogue between the union leadership and us as a contractor just to really to make a a management team that includes the the union hall instead of just always having a one-way dialogue from the contract of the union hall the IBEW International office has asked every local to adopt the code of Excellence from coast to coast getting a leg up on the competition that's allowing the union electrician to become more competitive in the short and long term to save 10 cents today but it's going to cost you a dollar you know a year from now it doesn't make sense it doesn't go on just to be a sales tool it's actually the real deal well reputation is everything and if you don't have reputation you have nothing so a customer service plays a big part of that so as long as you make the customer happy and give them what they want and give them ideas of if something they want doesn't work give an idea on what could work then I think it's a it's a win-win for everybody building on our reputation as the best electricians in the world the Nika IBEW team is using the code of excellence in Omaha and around the country to deliver unparalleled service and results to building owners and municipalities if you want the code of Excellence on your next job a call to your local IBEW office will give you a good head start for electric TV I'm Tom Green thank you"

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"VideoID": "832",

"Title": "Redwing Builders Exchange Video Short: Electrical",

"URL": "https://www.youtube.com/watch?v=c5KtUF3Aq8A",

"Keyword": "Commercial electrical construction",

"Transcript": "foreign this process usually happens right after framing how many circuits do we have in the house we have three cool pretty cool so let's get this one wired up oh wow yeah you see it coming together yeah [Music]"

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"VideoID": "833",

"Title": "#277 Mike&#39;s Tool Fun talks about commercial electrical jobs &amp; how he got into real tool reviewing",

"URL": "https://www.youtube.com/watch?v=iSU1X\_9Cz-0",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] [Applause] on a dark desert highway Cool Wind in my hair warm smell of colitas rising up through the air that's all I got have you heard the Spanish version of that one no I love it I have it I should let it yeah I'll send it to you so you can hear it man great track you can never go wrong with that track no I like the eagles but you know I'm terrible singer no don't worry this is not a this is not the construction life Idol this is just a construction life so it's all about talking about our trades man welcome Mike welcome to the show thanks appreciate you being on here and thank you so much for I've never had honey Jimmy B man yeah it's uh really good just put it on a nice drink it straight and slow and it's nice and smooth yeah yeah the honey you can taste the honey there yeah and also another you can mix it with ginger ale too oh there we go somebody's getting drunk yeah Mike's up welcome to the show here we go uh electrician you're a licensed electrician I'm a licensed I had a question Angelina actually brought it up which was really interesting on Instagram you've got electrician then licensed not licensed electrician I just put it it's just the way I worded it that's all it was a licensed electrician yeah because there's different um you know there's different licenses as an electrician as well too right so that's right yeah so I'm just a licensed 309a okay not just just some people not even that yeah not yet yeah yeah so you can find Mike on IG at Mike underscore tool sir Mike's underscore tool underscore fun yeah and then yeah that's that okay and the website is also my toolfun it's uh YouTube channel I have a website got it okay so you'll find it if you search on YouTube from Mike's Mike's tool fun yeah all right so what do we want to chat about here before we get started sorry uh cam thanks so much for the tea Uh custom developments I really appreciate it anybody want to reach out and give me a t let me know it's an extra large uh and then I'll throw it on and wear it while we're talking on the show uh if you watch it on YouTube you see me wearing it I'm legitimately wearing the tease man so when you say tease you're talking t-shirts t-shirts yeah sorry T not the letter T I was thinking tea you drink tea oh tea I do drink tea too but uh I'm gonna drink the honey I'm not gonna drink the tea then I might need the tea after I finish the honey where do you want to begin Mike so um how is it being a Sparky and I guess let me ask you my first question what type of bike vacuum do you have uh I have the uh Milwaukee pack out the battery walk yeah yeah because I I know a lot of sparkies out there don't have any vacuums and they don't have any brooms and they don't have any dust pans and that's like the biggest gripe from every other trade they always talk about all the little copper off cuts and so that's why I ask every electrician what what's the vacuum you got yeah so I'm an anomaly I have the vacuum I also bought all the attachments for it I have the power head for it so it's you know when I'm in customers houses if I'm doing say a service call I can vacuum their carpets yeah I have a broom and dustpan and I also have an expanding garbage can that I take with me and I'm the only one I think who drags that garbage can around beside me on the job site so as I do my rips I rip it right away oh I've never seen that yeah Rocketeer tools makes it and it's just a it's a folding can so it's just a small you know folds up I throw it in the back of my van and then you just oh it's big as they expand it's like a full-size camera no way really yep I've never seen a Sparky actually pull that out and use it yeah I think I'm one of the only ones when did you get started man I started in 1994 this will be my second career what were we doing before I used to manage special events like car shows and that for automotive manufacturer nice I was a subcontractor to them okay and anything like TV commercials photo shoots Auto shows all that kind of stuff that's what I did in Canada nice and then you got into why electrical so I left I left that position because I had kids and that job required traveling all the time and uh it just wasn't working out with me being away from home all the time and having the kids so uh family that are electricians and they got me into the trade and since 95. since the 2000 since 2014. well oh so that's brand new eight years yeah wow okay I didn't realize that yeah I've been licensed for three nice yeah and and mostly commercial rezzy I'm mostly commercial I do Residential as well oh I totally forgot hang on a sec we started recording because he got here early you got to give me one second yeah no problem just let it record I totally forgot man no no no no no no no no yeah that's better all right thanks for coming back sorry Mike yeah no problem live studio ah where were we um so okay so yeah so being in the trades for me is new relatively new for the last few years but you're already licensed so yeah and Commercial is the majority of what I do why do you prefer commercial over the resi I do prefer commercial the company I work for we do all three we do industrial um we do commercial we do Residential but I prefer commercial and I prefer small commercial jobs I'm not into doing uh like big huge uh um like apartment buildings yeah I did for the company I worked for before we did some apartment buildings and that but I'm not I don't like being on I like to be able to just go on a job site we're only going to be there for a couple of months and then go on to something new I don't want to be stuck on a site for two or three years that's a long time it is and a lot of them are along when you get in those big jobs you could be there five years but there's also a there's that Vibe of blinders on and everybody just comes in punches the clock does the job and get out there is a lot of friendship so to speak you know what I'm saying right the well the other thing I like with this one is you're thinking a lot more so you're getting a set of drawings you're into a small facility and then you just if it's a renovation like I'm right now I'm on like a tour in Ontario doing um Renovations of a fast food restaurant and we do a store week and basically it's the front area we demo it it's we go 24 7. what's the size of the crew uh so there's I'm the only electrician on it and you're doing a store a week yeah it's just the front part of the store like we're just ripping out the Millwork yeah I run a couple more circuits if I have to and then uh um uh we so we so we rip out the mill work we trench the place um the plumbing does their Plumbing stuff we have the carpenters Go 24 7. I come in I do like maybe eight to ten hours a day and then for five days or for six six days I start on Sunday I usually finish by Thursday afternoon wow and then on uh Friday we hand the store back over to the to the owner does the whole schedule just get destroyed if you guys don't finish it on that week yeah so every store we've always we've run into something yeah I can only assume that's what I mean yeah that causes us to add a date but we have a really good crew like uh the so I work for a company called George Moore electric okay and then we have a sister company which is Willowbrook construction okay and so we're both on this so we work as a really good team and you know when we run into those problems we were able to just work at it like we have a good open line of communication between myself the the Carpenters and the plumber that's there which is Eagle Eagle Eye uh Eagle Eye Plumbing I can't remember okay but yeah anyway so we we have this huge this big open line of communication between each other and the whole goal on that is just keep the trades boom forward so you know we work with the GC and and everything we do is just try and keep those trades going forward and so that's how we're able to it seems like no matter what we end up being done on time like it just seems like that's how it always ends up even if it's something big we've been delayed a day and half and we still end up paying the store over Friday afternoon so it's just an oil machine like you guys all go in it's done do you guys get a lot of pressure I guess from the management of the franchisee where it's like every day is not being making money that's yeah well I don't I don't deal directly with the uh the man the management company but I'm assuming there is pressure on the other guys and they nobody really rides us though like because we have this Mutual understanding like look we got to get this job done you know we'll do what it takes to get it finished and we all agreed like we're on this tour because we all agreed to do it it wasn't like we're Blindside and all of a sudden we're doing this you know it was like this is a big job do you guys want to do it it's gonna It's Gonna Last a year and a half there's a lot of stores to do in Ontario like I think we're doing 71 and I think we just finished I think I just finished number 25. a store a week I'm still trying to wrap my head around the store a week yeah store a week so we go in Sunday afternoon we demo rip everything out I go in there and I start figuring out existing stuff what I can reuse what I can't reuse and then the Carpenters they sit down and figure out all right we got to keep this get rid of that whenever the drawings tell them to do and then by Sunday uh midnight the scanners come in so we we pay a premium to get these scanner guys to come in they scan the floors two in the morning floor Cutters come in they cut the floor right after that's done guys come in and they just dig trenches they dig the trench all out and right in the morning by 8 A.M I'm back there with the plumbers the plumbers are laying everything they need to in the floor I'm roughing in my rough in I'm usually done my rough-in by Tuesday morning and then uh plumbers get their inspections I get my inspections and then Tuesday afternoon we're filling the floor back in pouring the concrete and then tile guys show up Wednesday morning they do their tiling and then during this whole time I'm all I have my stuff I'm doing in the back of the store or whatever so I just keep myself going and then that's why we're able to get it all done we just kind of we keep the trades going everybody just has a job we know when and where to be and we just jump LeapFrog each other the first few stores we did was obviously hiccups and we ran learning right exactly but once we got a routine going then we just kind of and they're kind of cookie cutter they're well it's pretty straightforward the size and the scope and the dining area the kitchen area as service all that stuff it's all designed scanners are coming in how deep can they scan that I'm not exactly sure I think of two or three feet all they care about is not seeing anything so they can create a path for you guys to run all the new stuff right that's it well all they care about is making sure there's nothing directly under the concrete yes right and then the Cutters come in and cut after that we'll dig we hand dig and then we just find where um you know there's con electrical conduit under there you know we just kind of work our way around it I'm just thinking of the scanner guys like if they wear red sunglasses thinking they're Cyclops or something like that right yeah exactly like dude take the job a little less seriously yeah I mean I can see through concrete yeah no that's I'm still fascinated and that that's I guess that's level of respect because you guys are all respecting each other to trade going in there here's the task here's the scope we all work together and we get it done and it's got to have a nice feeling at the end of that process where it's like we just finished the story we're weak man yeah exactly honestly man that's like that's insane yeah and I'm actually I enjoy it like I enjoy the crew guys I'm working with you know we we all have this like we go out at night time you know like nice right so a lot of them go I don't go out too much with them but uh you know I was I try and you know keep uh like they're all good guys everybody just gets along and I think that's a key thing is we're uh you know we have that open line of communication and it I know when the plumber first came in he was kind of Blown Away that hey like let's work together on this you know I'm in the ceiling running conduits and he's trying to fish his Pax lines down there so I'm like I'm grabbing them like just start sending them pull them he's like whoa what the hell is this right like electric you're not a plumber yeah electrician's gonna help plumber I'm like listen man you're gonna sweep the floor up after I'm done so I'll just help pull this back to work right so he was a little caught off guard that yeah you know and then now now we get along really well and the and uh um like we work with each other like I'll get up and you know his name is Andrew and I'll be like hey Andrew man like what do you got going on in this wall because I don't want to screw up what you're doing right nice because if I if I get it I can move my wires he can't move his Stacks or anything right so I'm like where are you going tell me what you need to do and if I'm already a lot of times we'll run into blocking in walls and we have to fish stuff down the Walls if I'm already in there I'll ask them like listen are you running your pipe up this like this open spot he's like yeah I'll I'll just get a bigger bid on my whole hog and I'll just core them the hole straight up because I mean I'm already doing it right and then that's working together right where we just kind of like so then he comes in he can get his stuff in I'm pulling my wires where I want to pull them and same thing with the HVAC boys there's no HVAC on this we're only um we're only doing the mill work so like a Coke machines um they've got a couple of these new units in that just need Plumbing um juice makers coffee like I guess with HVAC it's already set up for the space that's there exactly yeah we're like like these are Renovations not new stores so the HVAC is already all there we do have to work around it so we run into a lot of sight condition issues um like especially if we're trying to hang monitors and we have to do framing above the ceiling and all the hvacs in the way so some some stores of Mars had the you know adjustments because you're dealing with that yeah yeah that stuff's not moving so and so you've got work for the next just over a year yeah I started in January and uh we'll be going until I believe it's June up next yeah it might even be longer because we do uh whenever there's a long weekend we don't we don't do that week because it's hard to get the inspectors to show up in inspect so going into a long weekend or coming out of a long time I had a long weekend so like if it's uh if the Monday's the holiday we won't work that week we won't do the job that week so you get a week off basically I don't but we could I just go do other stuff got it our company's pretty busy how are the inspectors are they pretty cool they're like it's routine they come in they just they're visually everything's there you can't hide anything no it's all open and I and I run clean like I don't I don't try like my biggest thing is I take away the excuses what I call it I don't I don't need inspector coming in and you know he'll sit like I've had an inspector come in and be like oh you got to strap all this stuff in the ceiling and I'm like well none of that's my permit I go this is what I'm dealing with over here so now if I'm working in those areas I'm just going to strap it like I just stick to take away the excuses so when he comes in he sees it's a clean setup all right everything's clean I don't mess around and you know I follow the code book pretty pretty to a t like if we're doing demand calcs and stuff I I deal with it and then I'll uh you know and then I show them if he asks for it I have it there and he can see exactly what I'm dealing with let's see what's the primary thing that they're looking for it's just that everything's run properly visually like you can you're not spaghetti up there yeah well that there's that like um because I'll run conduits from the panel to the front so they want to make sure my pipe fill you know I'm not overloading these conduits with more wire than I should because that generates heat right yeah it's not good they want to make sure I'm derating wires so if I'm pulling uh I gotta upsize the wire for a bigger circuits kind of thing right so when I'm going to have them in the conduit when I'm running more than three wires in a conduit you have to derate it so you know just stuff like that they're looking for I've had them call me on certain things where but I've had it correct and then they would just see oh yeah you did upsize the wire perfect and then all right this is good put their sticker on the panel and they leave that's it I'm just curious I mean how much power is coming into a typical establishment like that what do they set it up at usually it's a it's uh 600 volts coming in and Transformer steps it down to um 208 120 208 and it's usually 400 amps 400 amps for a typical size establishment yeah yeah you have two 200 amp panels or 400 amp panel yeah and that's it and then and then you also have the I guess the building inspector coming in for the plumbing purposes and any kind of there wouldn't be structural at that point there is yeah because we actually um we move walls sometimes so the so they'll be sometimes the building inspector the plumbing is the same as the building inspection like that's happened a few times also the times yeah unless I guess they there's always supposed to be two different inspectors but I guess they can both inspect either or right right and they yeah and they um a lot of times they'll come in they just want to make sure that they you know doorways are wide enough like if we have to throw a doorway in there um wheelchair accessibility yeah that stuff yeah like the one we just finished in Guelph on on Friday which was yesterday that was the we moved a door and we had exactly enough space but they're shelving inside the doorway so the first thing the guy said if you want occupancy that's got to go so it makes sense yeah because it's blocking the doorway it's blocking the doorway so I mean yeah I'm still trying to wrap my head around in one week man because I'm coming from Custom rezzy right it's a different mindset so custom I I've worked in a lot of residential as well like our like I said our company is very Broad so um I prefer commercial I prefer commercial what's the top three reasons why you prefer commercial over a custom resi so with a customer right client client client it's customers all right same thing so I don't get me wrong I love our our customers are great and majority of the ones I work with are great um sometimes though they like to make a lot of changes and they make a lot of changes after the fact so you're you're finished and then you get a call back um I did one a while back it was uh they didn't want plugs in the bathrooms and I'm like well you need a plug in a bath and they're like okay can you put the plug in the counter like in the cabinet oh you can it's Marshall in in a residential you can as long as when you close that cabinet door it de-energizes the plug okay right so I said yeah I can but uh you know here's what I got to do and the cabinet you're supplying is not going to allow that so I got to buy switches and I got to modify what's the law what's the reasoning behind not having energy to a receptacle inside of a cabinet so if uh something um let's just say you have an iron curling iron you stick it in that cabinet you close the door walk away that thing's heating up catch fire right I'm gonna put an iron inside it I know you're talking about human being the dumbest species on this planet I get it I understand it right so I mean because the majority of clients I know they have always wanted to plug a water pick or some sort of rechargeable toothbrush and leave it inside the cabinet so it's constantly charging right but you're right that someone can take out that and plug in a curling iron or an iron and all of a sudden you've got a heating Source inside of what cabinets it's not it's not even that even if something starts to short out and you have a less of a chance of seeing it because now it's in a closed cabinet I think there's a rule in a if it's like a kitchen cabinet and you got a uh say like one of those like us um Dyson vacuums or something that you plug in the cabinet charging unit I think you're allowed I think there's a rule there's an exception to that but I'm not 100 like I said I'm not heavy into residential yeah right so like Custom Homes like we just did one recently and and uh yeah it was the same they wanted closet doors when you open it lights turned on you know there's just so much so what's the fixture that you're using I'm just curious myself there's a hinging mechanism for the door that shuts off or or trips to switch is that yeah exactly just basically when you close the door it kills the power to the plug so it would be no different than any door that has a hinge Mount exactly light feature right that's all it is that's exactly what it is yeah but it's you know it's designed for Millwork there's a hinge ones that you have that you're talking about are a little bigger yeah you actually have to carve out the door frame it becomes the the trim uh guys uh responsibility at that point exactly yeah what I do for the trim guys though is I'll I'll actually pre-cut in the 2x4 and then I'll uh I'll make sure it recess is in there nicely first so then when the trim guy comes in they can just rotor zip or whatever they want to do yeah to have a clean cut and my box just slides in nice yeah and then it saves me from getting pissed off because I can't get a phone call and I can't get it in there now I got to use a chisel and carve out and yeah I don't want to carve out a two by four yeah exactly there's a nail right there yeah whenever I rough in the way I rough in is I want to be able to just walk around with the pair of wire strippers and maybe a screwdriver in my alignment I don't want to deal with and you vacuum my vacuum your container my garbage can is what follows me around majority is on is it on Wheels no I just drag it you just drag it it's very light like it's just a canvas bag with a hard bottom so it can sit in a pool what's that retail for uh 20 bucks twenty dollars that's insane yeah I brought when I first brought it to the job site I'm on now um two other guys bought one right away yeah they looked at it and they go that makes a lot of sense man yeah they're like this thing is crazy yeah so they're just and then you can fold it and throw in the back of their pickup truck or Vans out of the way like it's very thin right so yeah and it's uh so I'm trying to figure out what else is uh interesting in the commercial side of the business there I guess it's just steady work you're getting things done you move on to the next one and then you get the next that one yeah well one thing I really love about commercial is Conduit I love running conduit so what's the trick with because sometimes you'll get a new guy who says he knows how to bend it yeah and then you watch him and it's entertaining to watch right so what's the trick with bending conduit practice practice that's all it is that's all it is when I first started I was terrible it was terrible pinching everything it was bad I just but I had a really good journeyman that I actually was patient with me and uh um he taught me exactly what to do and he just kept making me do it like every time we were in the situation he's like you're bending all the pipe right it's the only way you're going to learn exactly and now I got pretty decent at it and um you know I'm good with it and my favorite thing to use is a hydraulic Bender I love using for the bigger pipes but yeah that's one of the big things I like about the commercial and that it's um I like the atmosphere of it like residential I'm not really into the I don't even know how to even explain it I just think that I don't like the material you're using in there the nmd wires that rips apart on me all the time I'm used to dealing with B like BS armor cable stuff right yeah you know pipe and fill and dealing with Transformers and stuff like that and then I get into residential it's it's hard on itself because it's a whole other set of rules for residential versus commercial two rights yeah is it different inspectors I'm curious I know it's the same same guys they so they need to know commercial and resi and Industrial and Industrial as well because they'll show up into industrial industrial's got to be insane yeah a lot of it can get complicated I do we'll do like small small industrial stuff yeah yeah there's a meat factory in Whitby that we do a lot of work uh inside and it's like a full industrial thing and there's a lot of controls in that we have a guy that works for our company who's really good at control so he's the guy who gets thrown into those places what's the biggest conduit that you're using on a commercial site because I know in Rezi if you have to run conduit you're just using one inch I don't think I've ever seen anything large and a quarter that kind of two two inch pvc residential as well when you're doing the service coming in yeah um for me it's only been really two inch because I'm dealing with small stuff but one of the guys I work with he's dealt with bigger stuff he's done warehouses and I see you're dealing with three or four inch this is standard it has to be metal conduit or you can still get away in a commercial it can be can't be PVC so I don't I keep hearing that there is a rule where you should transfer it from PVC from the outside to EMT when you get inside yeah and that's what I've been doing um I haven't actually found a rule that I don't know if it's a building code rules but I haven't found one in the electrical code book that now I could be wrong it could be there where it states that you have to use EMT inside a building we just generally I use EMT inside a building I just I try not to use any combossible type materials like PVC or you can see right yeah that kind of stuff right yeah so the big question I mean I've asked this to several electricians is why is it that in here in Toronto the whole infrastructure is aluminum Right comes right to the structure aluminum and then they force you guys to do everything copper inside copper or you mean EMT like metal not metal no the actual wire itself like you can't continue it in aluminum right okay so aluminum is uh I find aluminum is not it breaks really easy riddle right it's brittle yeah so I maybe that's why they're having a switch the devices out there aluminum devices are really expensive so if you want to run aluminum inside and uh you know you want to put a plug-in you got to buy aluminum oh wouldn't that just be supply chain like if you started pushing everything aluminum receptacle-wise right switches it would be cost effective I just find it funny I'm only speaking on trunks I don't know about other places but the whole infrastructure on the outside and Toronto is really bad because the whole infrastructure is above ground right right or some areas is below ground and set up in Pittsburgh whatever it's all aluminum but then you have this argument about how you know they they want to see all this copper coming out of to to make your connection at the meter and then it comes into the house and everything has to be copper right so we're we're allowed to run aluminum from the meter into the panel okay yeah yeah you're like even in rezzy yeah up to but for one meter isn't it one point something meters something like that something like that yeah yeah because the meter base is usually just BSA inspectors are going to come out of the woodwork now they're going to start sending DMS and yeah hello hello everybody yes send your DMs yeah that's fine you know if I'm wrong I'm wrong yeah um as for copper and aluminum like aluminum's high maintenance too you have to constantly um every few years you should be taking your devices and just making sure your screws are tight because this all yeah who's gonna do oh he's gonna do that that's why we have insurance companies will send ah saying I've done it where I've gone into right uh to places and I have to make sure that every single one is good yeah before though I'm sure it has once they find it the house has aluminum wiring you know I've been sent in there can you just make sure that every single one everything every single receptacle I've gone into a house where I had to do this and the first thing I did was I take a light off the wall and the wires are completely bare because someone else married copper to aluminum so it oxidized right and so then you can't do that no you can't and then I ran I did one where in the bedroom and the guy's like well this respect receptacle doesn't work so I open it up and it's a copper rated receptacle aluminum wires on it and there's nothing left of the wire like it's completely gone I think I might even have pictures of it on my Instagram that's insane and while you're there do you ask them should I change the smokies that are all yellow right now look like Millennium Falcons or something like that well I in that situation I actually called my boss and I said you really need to tell this guy like time to update we got to go through everything in this house because it's this is a fire hazard and he's got kids in this house right so that's risky yeah it is risky now that's why I don't like aluminum I I like even still you take it off you write your copper tails on it with your aluminum rated wire nuts and then but you're supposed to put um no locks is called yeah that's what it is yeah so any any aluminum wiring that came out I think it was after 1980 or 1982 is not pure aluminum so technically um when you use those wire the aluminum rate of wire nuts you don't need to use no locks but I still recommend you do it if you Google it you'll see on so how are we supposed to know that aluminum is pre or post no you don't you just put you just do the no locks okay all right you just do it but yeah if you Google it you'll it is on uh on Google there where it's because I remember hearing um someone was talking about this and I'm like I gotta look this up because before I think it was 1982 they used a different material for the aluminum wiring and then it was somewhere in the 80s were they just putting filler into the material I'm not really what's the other what's the mystery meat in there like I don't know I don't know what it was in it but it would just be more reactive with copper than versus because if you read the white the aluminum wire nut package it says that you don't need to use no locks on oh it actually says that on the package yeah in the uh because I had somebody point that out to me on uh on a job site I said well I don't care this I'm still going to use them but it's funny how you remember what is it maybe a decade ago how the government was pushing CFLs Right light bulbs yeah and if you actually stopped and read the packaging if that CFL bulb ever broke you're supposed to call the Hazmat unit because there's Mercury inside there yeah what did every homeowner do through vacuum it up or just screw it up and Little Billy come here and snort some of this Mercury that's in the air right now like that it was those things were so dangerous and they're still selling them I think in some of the big box stores yeah they're uh CFL Bob's not good but the government pushed them pushed them pushed them and I'm like I don't like these things I didn't like them for the color temperature yeah that's why I didn't like them right because like I had I don't know I had different warm weight or no in the very early stages it was always cold it was always a cold it was always almost yeah it was over 4 000 right so it was 4 000 Kelvin so I was like I don't like that this is great for commercial yeah but for a home I'm not a fan of that right and I don't think you're supposed to throw them out either I think you're supposed to no you have to you have to go exactly yeah there's a prop but nobody ever did that no but if you read the packaging it actually says there's a disclaimer danger disclaimer on it right which is kind of but nobody would ever assumed but then as kids you're you're like are we not Star Wars fighting with uh uh fluorescent tubes oh yeah we were all doing that right and then bursting them all out right so it's just like yeah it was cool when they exploded but that was dangerous as well too not just for the glass but for the gas right right yeah so that's what I thought that was kind of interesting but let me get into a little history here it's not really electrical related it's just part two of another series of most expensive Woods in the world so expensive wood wood yeah KOA is 62 bucks a board foot it's a medium gold into reddish brown in color with ribbon-like streaks comes from Hawaii Hawaii I've never seen it never use it ebony uh 65 bucks a board foot it's near black in color can be finished in extremely high polish comes from India Indonesia Sri Lanka and Africa Brazilian rosewood I've I've seen that it's beautiful 70 bucks aboard foot South America and specifically Brazil Pink Ivory AKA Red Ivory 80 bucks a board foot pale brownish pink almost neon pink like your logo man uh African Blackwood is a hundred bucks a board foot as I've seen it as beautiful Deep Purple uh black color fine grain arga wood is what the are you kidding me arga wood is 3 200 to 4 500 a pound or up to 45 000 uh per pound for the highest quality not a natural wood but the result of a southeast Asia tree infected with a variety of mold that darkens in color and makes it dense uh wow I don't even know that one man um so um where did you start the whole with the mic fun tools thing so I my wife actually was I'm not a big social media guy or I wasn't my wife uh entered a contest a while back and won a uh Bud Light reclining leather chair so I'm like that's a big deal yeah I'm like you won this off of that she goes yeah I want to win stuff so I'm like what she's like why don't you go on there and talk about tools since you're kind of uh a tool [ \_\_ ] essentially so I said okay all right I'll get on there so I didn't know what to call it so I just called it Mike's tool form that's how it started got it and then uh right away I started entering contests and stuff and I won a couple of them and got a few nice prizes and then I started really focusing on On Tools because I I was ex being on the job sites and experiencing tools with a whole bunch of different trays um you know I try out different brands and that and I went through a few brands in the last eight years until I finally landed on one that actually works for me after I've I sat down and actually researched what are you talking about your general arsenal of tools yeah are you not Makita so or you're either Makita or Milwaukee yeah so I'm Milwaukee okay yeah so what I did is when I finally I started out yellow okay big mistake that's odd for electrician well I I was still I was a first year Apprentice I didn't know what to get you're confused exactly and so I went out and I bought this yellow XR spent a lot of money I probably shouldn't have on the set and I I let it sit it sat for a couple of months before I finally actually had to use it so then because on the company I work for just supplies you drills and so when I was on the job site we had no drills left because we had like 10 electricians working I went and I I'm like forget I'm gonna bring in my drill and I drilled my first hole in the side of a wood cabinet and the transmission in the drill shattered and I was like what the hell is that the DeWalt yeah so I tried to get it fixed I tried to return it because it was past the 30 days at the store I bought it from they said no you got to go to a repair a repair facility so I wanted to repair absolutely said no you abused this drill and you made one hole and you abused his drill so I so I so I contacted to walk through their customer service and they weren't gonna warranty it at first and then finally I think there it was like a back and forth this hat like I said this happened in 2014. it was December 2014. they finally came back and said okay yeah send it to this facility and we'll authorize a repair so as soon as I did that I sold everything as soon as I got it back I sold it all I said no more did it look like when you gave it to them did it look like it was abused by a tradesperson or did it look like a normal looking drill it just looked like a normal looking drill like when I drilled into the wood I went right to the butt so I on the Chuck there was a little bit of wear from drawing in there but that was it and I pulled out and it just never worked again I mean every Trace person's done that yeah right sometimes we do it because we just like that we leave a little Mark around the wood that way right yeah so it should never that must have just been a faulty one that was just built package yeah so so like I said the the tool itself you know obviously something's going to happen it was bad it was just dealing with the warranty part which frustrated me so my uncle's electrician said get rigid they got unlimited warranty so I went I bought rigid I liked them had no problems with them but as I progressed in my apprenticeship um I was starting to run into issues where I rigid had tools didn't have tools I wanted biggest thing seller was I wanted a one-handed Sawzall something I can do conduit with while all the conduit right yeah so I started looking into you know who's got one um Makita had one that has like a seven eight stroke or something like that it wasn't very very good one of my friends who has Makita bought it and it wouldn't cut the EMT we thought it was a fault went got another one and it wouldn't cut it wouldn't cut it no and he went through two of them so he said forget it was it the blade or was it no we tried everything different blades he returned it even was it just a stroking mechanism of it or something I don't know it was a it's a little one-handed one that kind of looks like um looks like a old style gun I don't even know how to explain I know I know what you're talking about and it wouldn't cut it wouldn't cut it no it wouldn't cut DMT that's a little surprise so okay before I bought I started researching yeah and you know I discovered like Makita is a really good brand of tools for Carpenters yes they're very geared around Carpenters yes and there's a repair facility not too far from where I live where you can if you do run into an issue you get your tool back the next day yeah um so then DeWalt again even looked into it but the warranty thing I just I couldn't deal with with that so I just took them right off the table one of my friends ran all Hilti and I tried his stuff and you just couldn't rack it but I couldn't afford healthy it was really expensive my surprise yeah it's it's well now it is I noticed that everybody's kinda they just kind of got I think they did that on purpose all the manufacturers no no Hilty yeah put their self at a that much of a price point to kind of just eliminate certain part of the market it's possible like they're definitely geared to 100 towards trades how is their service because I hear it's good it's really good so the guy I worked with he same thing he would take it in and um they had like a you know battery they test their batteries they you know and turn around you know repair whatever it took it like no issues he had no one would take care of you they take care of you but they're limited on where you can go there's only a couple Hilton dedicated stores right yeah so then I was reading about TTI which owns Milwaukee licensed Emerson who owns rigid you know they own Hoover I think Dirt Devil like all these different brands and um the one thing that I liked about Milwaukee was they had a good warranty so and they had the one-handed Sawzall that I had and they were geared towards at that time uh more electrician and plumbers yes I think they're a wider range now with what they have they're expanding yeah expanding but they are really good they still have a crappy miter saw and they don't have a table saw and I think they're just launching a track saw yeah so they have a table saw it's cordless oh do they yeah they have a cordless table saw some guys say it's good some guys have said that I've talked to Citizens the guys that say is good are they Milwaukee guys are they DeWalt guys uh so neither there's a they're they're uh there's a lot of the guys I work with are everything they don't care it's a rainbow yeah right and so they like uh like there'll be one guy who has a DeWalt Makita and like those are the guys who actually are probably doing better because they're taking the best of each of the brands yeah so but your Milwaukee Sawzall it the reciprocating actually cut the content cut everything no problem at all no problem I weighed it I bought the uh 12 volt version of it when I first started and it's lighter and it's easier yeah and it was cutting no problem but what I found was um I really wanted to get into just I wanted one battery to work everything and so I switched to 18 but everything and then I went I just bought all Milwaukee 18 volt stuff there I have a grinder that's really good I can cut like three quarter inch rebar with it it doesn't stop it's a rapid stop because I'm one of those guys who lets go the trigger and lays it down and exactly right so this thing's shut it's got a break on it shuts off right away right so um so I ended up just sticking with the one brand because I want the one battery like I want to be able to just have one battery interchange between all of them and now Milwaukee's come a long way and so has Makita and soul has even rigid and even DeWalt like DeWalt is coming in with a lot of good stuff there's some things that you know guys might complain about like nailers or something like that or would you ever go back to DeWalt I would never go back to the world no no no I think that once you find your platform and like you said I just want the batteries it's just I have all the tools I need a battery I grab it I don't need to find a separate tool separate battery separate charger separate everything exactly I got married to the one brand now yeah unless they go belly up which they won't yeah right so you're Moana and that's what it is there's certain trades like electricians plumbers like uh HVAC they're all Milwaukee they suit them right but I think Milwaukee is trying to do what every other brand is trying to do they're just playing in different sandboxes and so maybe the weekend warrior you're an electrician you've got some woodworking to do at home then you're most likely going to buy a Milwaukee table saw and you're going to use that instead of uh their competition right right but over that for for me as a weekend warrior I'll stick with corded uh yeah because you're plugging everything in man right so especially with the table saw I'll stick with corded I don't need a battery powered for weekend stuff like unless you post it on Instagram and you want to share it off and then if I get enough people who are bugging me about it I might do might do something on it but like what when I do my Instagram or my YouTube I kind of I want I know I'm still at the very beginning stages like I'm still trying to find my my way uh your voice my voice I'm still trying to find my voice so you know I'm trying a little bit a couple different things here and there I do it all just with my cell phone right it's not I don't have any fancy computer or any of that stuff I just put it on my phone and what I want to do is um I wanna my idea is to show the tool first talk about it when I first get it and then after maybe a couple weeks or a month or so using it talk about how it uses and if I can film me using it I will I try not to do videos when I'm on the clock with the company I work for and if I do do them it'll be like during like I take a lunch break I'll be like I'm gonna continue to sneak into it do it and that's it right well you're actually doing the videos on a real job site real work scope of work instead of a stage kind of right a lot of guys are staging it they'll get a two by four and they'll just start drilling through where it's amazing look at how it's first cut first blade first everything wonderful yeah it's good right right right I want I want to show how to abuse like I there's just one tool I have which is um Klein makes it and it's called the et450 and it's Advanced circuit tracer this thing I paid like 250 dollars for it is the cat's ass really yeah it's really good it's really good like um so before I was looking at it's comparable which Greenlee makes it's like fifteen hundred dollars whoa Ampro makes one that's like fifteen hundred dollars so I was in um uh the supply house I go to which is Oscar an electrical and one of the guys there he's like why don't you try this scanner it's 250 bucks and see how it works out and I'm like 250 bucks I'm like why not right so I grabbed it and I tried it and I use that thing daily now every day like when I do these stores I would spend hours tracing stuff out because nothing's labeled nothing's I get in this thing I just clip it on and I go right back to the panel and tell yep that's it this is it you know and it will do it'll do up to 480 volts so how did client figure out how to make that product for so much cheaper than the competition I have no idea maybe but they figured it out from the country is manufactured no no I have no idea but all like I've done a few video it's probably I've done probably three or four maybe five videos of it I've had it where I've had the trace um I went into this house and they're like our stoves they just moved into this place and the one stove wasn't working and so I couldn't figure it out I'm like there's no wire in the panel for the stove and so I I plugged hooked this thing up the wires and I went through the walls and I was able through the wall find the wire and I walked it all the way back and found it in the panel and actually at the panel it was coiled up and stuffed right up into the ceiling and so I guess they put the plug in as a future and then they never they never did it so I pulled it out and I'm like here it is I hooked it up and then they had a stove that was it like all it took was just getting in that's a smart tool man it's insane I picked up stuff in the in the ground I had to trace stuff uh like so I have my my own house I have a swimming pool and I had like an issue running Underground wire running underground and this thing will pick up and you just follow it until it stops picking up and then you know that's probably where the break is right so you just try and look in the area and I kept picking on what spot you dig there and then there's your break I actually my mom has a horse farm and she had um she has electrified fence and it just quit working and she couldn't find a break and so I hooked it up and I found the brake what's the distance it can go so in this case it was only like a foot underground the wire so I was able to find it at my house it was like 20 inches wow yeah and you'll pick up it'll be I actually have a video of me doing the one at my head actually I put the one for my mom too at the farm yeah trying to find one on her ground but um I've scanned through um cement floor I was looking for a conduit that was feet because uh one of the the um fast food place I was renovating yeah there was a conduit that ran into the ground and disappeared we didn't know where it went I couldn't find it I hooked this Tracer thing up and I figured it out oh it's running this path here and then I was able to go up the wall and then I found a berry junction box oh here it is right so holy cow yeah and it was through the walls like it's not the signals at that point though the Signal's weak when you start getting in the concrete the signal just like you're still getting you're still taking something to trace it right to follow it yeah it might be 10 like because the signal is based on percentage from zero to 100 yeah so if I'm getting 10 I'm like well I'm picking something up right I don't know what it is but it's there and then you just follow it until you hit it how would you have done it back in the old days I guess you would just would have ran a new line they wouldn't either I'd run a new line or I'd I'd uh short out the one side of it and then use my meter and just try and pick up the short in the panel or something like that got it um that's and sometimes it's time consuming like we do um one of those big box stores that uh home people I guess yeah right so we do a lot of service work for Home Depot and a lot of their stuff is 347 volts and nothing's labeled in those stores so and we go in and have to do you're talking about the shelves or the electrical panels yeah the panel or even the plugs like because I have uh what I do is anything I touch I label it that's my rule then if I get brought back or somebody I'm gonna I'm rare I think of the guy coming in behind me yeah right so um what I do is I try and label as I go so yeah label maker I have a label maker see that I every time I see an electrician with a label maker I'm like respect I'm sorry respect man yeah like I like when I do this restaurant every plug's dedicated I'll label like this is panel a circuit 25 Sure Shot panel B circuit 27 coffee maker right and I'll label coffee maker so these so the people who are working there no yeah I better just plug or plug in a Sure Shot or whatever it is they're plugging into these things fridge in this one right so but when I'm doing these stores like Home Depot I I'll put just whatever the circuit number and panel is because these stores have a lot of panels all over the place right and then and then you're trying to trace this thing and so you hook up this Tracer that Klein has and you take your one you just start walking to panels until you pick it up and then you're like oh you know what's in this panel there's a learning curve to this tool but once you figure that out um it's golden like this thing is brilliant so there's a lot of I guess a lot of electricians are buying this thing I know the store that I purchased it from I know that when I started doing the videos they said they were getting a lot of orders yeah and uh I've talked to a few people who posted on my YouTube and they're they must be selling them because they're having a hard time now getting this tool so I think Klein Klein must be selling I don't talk to anybody from client I'm not sponsored yeah yeah so they like because Klein's American no client is American but they have a Canadian Branch but I think they are American yeah really yeah I think they're American I know they're tools a lot of them are made in other countries but I'm not sure well every every tool needs something well it was funny when I found out that a lot of dewalts tools are made in China so are Milwaukee yeah so there's different divisions there's some that are made in the US and yeah there's a big chunk of them made in Asia right yeah like Milwaukee I think their pockets are made in the U.S but all the other brands are made in like the pack outs yeah I'm pretty sure they make the pack outs in the U.S somewhere in the U.S but the tools themselves are made in China yeah well I know when I've had to get service repair on them the service guy said he has to get all his parts from China and it takes forever to come in because I I immediately abuse some of my tools of course right you're a trades person we're supposed to I beat the crap out of them and I and I and they've been great they're like yeah just bring it in we'll fix it it's like that's it like I'm telling you I actually abused it like is this gonna get this is just bring it in we'll fix it and that's it and then I get my tool back and off I go anything else that's cool coming from Klein um for you guys to make your lives easier from Klein like there's I have that advanced circuit tracer that I use and I have a smaller version of that which is you just plug it into a receptacle and you can scan so you're not carrying this kit around um one of the things I really like that Klein has come out with are the wireless bluetooth earbuds so their line has that Klein has that they're not expensive I I think I paid less than a hundred dollars for them so the third the price of regular I think their way a lot they're they're not um so a lot of uh like my I think my wife has a set of Bluetooth ones but they actually sit in her ear and they're kind of like these ones stick out a little bit I don't give a crap and I believe there is noise canceling to them because I'll stick those things in when the guys are doing Drilling and that and then it's been fine I'll play my music now if they start getting the heavy heavier drilling I I have those uh like from Canadian entire Home Depot whatever I bought they're like 20 ear muff the kids yeah so I'll play those on over the yeah over the Bluetooth yeah and so you know so why do you like the Bluetooth this sounds good the sound is really good I can talk on it like a phone conversation and uh I find that it's not expensive and it cancels out a lot of the noise like I don't like a lot of times when we're on these jobs we're we're there at the same time guys are still demoing concrete right it just gets loud man so so that's a smart move for client to actually do that to get that now you're using it I'm using them and they're really good and they're like a little handy case and when they die you throw them in the case and the case charges them again and then then you just plug the case in and charge the case and just I've never thought of climbing like that way doing that stuff yeah like a lot of my uh a lot of my tools lately I've been buying have been Klein not not because I'm uh Die Hard climb fan it's just I find them more practical like they have this backpack I just picked up which has been I saw that yeah yeah that thing has been holy crap Night and Day from the other one I had it's organized it's a lot more organized and my favorite thing is I can take the middle out before I used to have to take half my tools to get the stuff on the bottom now I just take the metal I put off the side I can access anything remember the buckets with the little yeah and you get the hospital are they still the right are they still around the Husky bag makes no sucks and then bucket what are they bucket belts or no what are they bucket pouch or something what are they yeah you stick it in the bucket and all your tools all you're doing is just you're just ramming everything in the bucket and then you're playing Russian roulette by putting your hand in there trying to figure out what to discover oh there's the X-Acto blade they work out if you're trying to get on the roof right and you tie a rope around pull it up and you get up top right yeah but I find that most trades just dump everything in there and I think that you need a little bit more organization that's why the pack makes a lot of sense it does there's a lot more actually the the plumber that works with me when he saw my bag and makes sense for him he's like um he goes I know I'm a plumber I shouldn't be buying this but I'm buying it anyways right so so yeah he's got the same size fittings if you think about it his tools are generally similar yeah right and so it kind of makes sense yeah and it does the biggest seller I think for him was the uh the hard case on the front of it and it's the trades master pro tool bag I'm talking about yeah which is I think 55485 is the part number but anyways it's got a hard case in the front and it's got felt inside to protect your safety glasses that was his biggest thing and uh so when he saw that he's like okay I want this uh he goes can you get me one of these so I I ordered one for him how much are they are there if you get them from oscan I think they're like 200 and 200 or something that's not bad at all yeah they're still on the pack up price point kind of thing exactly yeah I think I think if you get off Amazon they're a lot more I think they're like 230 because everyone's getting greedy on Amazon right now that's it right so I just I try I try to my biggest thing is buying local or or buying at least Canadian as best as I can yeah obviously some tools in that I can't but um like all my work clothes I buy them all from northern boots and they're a Canadian company my work boots are JB goodoo like they're Canadian company Canadian made product that kind of stuff they're still made here yeah they're made here yeah that's very rare man it is you know that right yeah everything well I mean we have a population of 30 million people or 35 million people in the US is 300 million so they're probably gonna better off it all comes down yeah but the US is still shipping all their fabrication or the manufacturing overseas too right yeah well it's because everybody rules the almighty dollar and I I firmly believe that if you really start supporting the small businesses you know like uh you know we have the space here like we have the space here and we have the workforce here so then why don't we build it I mean this is a political question it is it is and like are the backbone of this country's built off small businesses yeah right and so you got like I don't mind going into a place and paying more money like some of the tools that I buy from oscan which is where I buy everything from is uh you know even if it is a little more expensive I don't care I'll buy it from there I'd rather because you know that it was made here well not even it may not have been made here it's just I'm supporting a small business right um and that's I just want local businesses to survive over like Home Depot like like yeah I like the big stores they're great like Lowe's is you know all of them are great I just I like financially I want to be able to support the smaller guy too like I still shop like crazy at Home Depot I I love it that they are still running a smooth business all the small mom and pop shops yes and even though all the big box came in yeah that was the biggest threat at first all the all the Mom and Pops we established we have a local we have the community we have local you know loyal customers right I'm sure they were probably fretting you know like really really worried that the big box was just gonna eliminate them all right and I love that they weathered all that and then all of a sudden the whole mess that happened from the last two and a half years they weather all that too you know what I mean and that says something to their client base and who they treat and how they treat everybody so I've I've always had a huge respect for all the small models it's a personal connection too when you're dealing 100 they know your name first of all yeah right so they don't know your name at uh at those big yeah the big boxes yeah you'd have to be labeled or something yeah pretty much nothing but I do spend a lot of money at Home Depot too there's everybody every trans person like I support like I that's probably the only uh store like that I go to I don't shop at any of those other lows or any of those like it just seems like Home Depot always has it has whatever my biggest thing is walking into Home Depot or any of the big boxes trying to get in and out as fast I can before a regular homeowners start asking you questions how to do things at home right I have actually run into that standing in the aisle Lane because he's trying to come across like I know what I'm doing and they're like I know you're not wearing an orange apron but it seems like you can answer these 15 000 questions I have of you know like no I gotta be wearing my hat now I know I just take my electrical hat off and leave it in the van because I've been standing there where I start getting nailed with questions like oh I don't work here I don't work here your electrician right I don't work here oh no I'm just wearing the shirt yeah I just wear it because I think it's a cool shirt it's a cool shirt right last thing I want to do is give someone advice and they burn their house down and then right then they come after you if they find me yeah but will this guy work for this company right because they see the logos so it's so starting like your first year in in electrical and then now has it just been about eight years of organization just trying to figure out how to be efficient as an electrician so the biggest thing for me is I want to be able to use my my mind my brain right so um I got and and tools so when I got into this um So when you say like efficient and organized yeah it was all like doing this whole trade I think anything you do you need to be efficient organizer like my previous job I had notes everything was organized like I was like we were running the car shows across Canada and I'd have to work with so many people to make sure we'd get our cars into those buildings you know and so I just kind of took that and moved over to what I'm doing now and just trying so when I walk into a job site when you talk about organization like one of the first things um um my journeyman would teach me is like don't sit there and walk into a place and start throwing plugs in or pulling wire he's like sit down for a few minutes go meet the GC say hey can I see your drawings take your drawings match them with his if his date's newer throw yours out he goes now you're on his drawings tomorrow right he goes plan your stuff out he goes I I don't care if it takes you two or three hours he goes out two or three hours of planning and figuring out what you're gonna do and always carry a notebook like I always carry a notebook and he's like write down some stuff he goes you might learn something new you might just figure it out and then when you're ready go around and start doing what you got to do so you know and that's that's how I was taught I was taught beforehand so I was taught when I got into the street and just kind of stuck with me it's the bull and the Sun at the top of the hill going down to the cattle at the bottom of the hill exactly right yeah walk down yeah I've had three really good journey man that and one of them I still work with and nice yeah and they're you know the one that I work with has been great with he's like very um OCD or CDO because it should be in alphabetical order right but him and I are both like OCD we're both very organized our bands are always immaculate yeah but you know he's taught me so much when it comes to like being organized planning the same thing he's like he's a conduit artist like he's a conduit artist and he does he's the guy like like conduit porn like it has to oh my God they're all like because it's exposed right it's so exposed he's doing a warehouse and like I went into this one warehouse and the runs were so beautiful and I'm just looking at this like I could stare at that for hours you did all this and he's like yeah man but he's an art he can draw he's really good like and so he's like just pay attention use your measurements like and then he'll get in there and just do it right and so but does he have a trick on how to like is there an increment that he knows the next line if he does I don't I don't know okay all right maybe he's not gonna share that right but he's got his mind works like he's a phenomenal artist like he can draw anything like freehand right so like he it'd be funny we had a trailer on the job that we're at and he there's pitches all over the place and I'm like when I first got like who did all this oh this guy did I was like what she did all these there would be a picture of my uncle because my uncle worked with us right and he'd just be like my uncle's big guy and very teacher how's it going right and so he'd do some comedy picture about him as well right and I'm like man this is crazy and then I see he's just self-taught the drawing yeah I'm gonna assume so I'm not never went to school for him no he's already he's like artistic type guy like he plays guitar okay cool guys right he's really good at his job so yeah so it kind of makes sense that he takes the pride in the conduit runs and not even everything like probably like he's the guy who goes in and if he sees an issue like he some guys will put horse blinders on like I'm only here to fix this right where he's like no we're fixing this and it most times it's quick anyways right but he'll he's very like it's the way he taught me was um you know just follow the rules like what's the point he goes you people strap condos he's very particular how you strap him he's like because it's the rule he goes why why create something that inspector is going to come in and crap on you for because you can strap the conduit broccoli so and that's the way he teaches sometimes he can be tough right but that's how you learn but he's teaching you yeah yeah there's been like I said three guys he's been one of my best you know he denies me oh I was never that good I'm like yeah you're good man so but anyways much older or no he's only a couple years older than I am okay I started like I said I started in the trade I was 36. I am 44 now right yeah I think he's 48 or 49 now so he's but yeah stuff but it's good that you started later and you've got all these lessons that you've took from the other industry brought it in life experiences because all these kids coming in they don't have these and they don't know how to do it or why to do it right right yeah well I was there 16 years and I start from the bottom at that job it was like so I'll just say because I don't know what you're listening is like but I believe in God I believe everything everybody has a path and I believe I've been very lucky and fortunate like very lucky you know I I uh I was in college doing Computer Sciences I hated it you know I used it well in the 90s like in the early 90s I worked at a computer store I was a teenager and we were building computers and that's what I did and it was great and then I got into college to go further with that and I hated why why did you hit it I just didn't like sitting at a desk like like you're typing programming like um when I was in high school we had to make a video game and you know I made this cheese ball video game and I'm like I can't do this like because it was very still I still think it was in his emphasis stages right like obviously the 80s you know with the Commodore and everything just kind of holy man you're going way back well I went at my first computer I never had my brothers much older than I am you had to program every video game and I still have the book I found it where you program your video it was a Tandy computer you record it on a cassette tape right you got any floppy disks at home no I got nothing now my brother's a big computer nerd yeah so I mean that's what he does for living now but I just so I was trying to follow in his foot's the older brother I looked up to him of course right I just couldn't uh I couldn't do it so I was on my way to a bar and one of my buddies was like hey we need a guy to work in this car wash you want to come and I'm like yeah why not so I show up to this facility the next day and they actually um their supplier for the auto manufacturer and they take care they uh they take care of all their executive vehicles and that's what the part was the car wash and then I saw they kept bringing in these concept cars of the manufacturer and also I'm like what are you guys doing over in this department and they're like oh we do all the shows for these guys and we're all you know so I'm like I want a nest man so what do I got to do to get oh you know because you're a car wash guy they're like ah we'll see right because a lot of guys who come in there just got like the turnover rate was so high right they figure they don't think anything of it no and then I got in there and I worked there for about a year then they finally gave me my chance to get into the other side and I just took off I moved right up to managing the whole thing around this is what I'm one time like so I got in there in 1998 and I left in 2014. so pre-fast and Furious and mid Fast and Furious yeah so during the Fast and Furious period everybody was pushing tuner cars and this company would build would get all these cars built and then we'd put them on uh Toronto Auto Show be a big big one we did and we'd have like 200 and something cars on display it was a big deal yeah yeah and so and that and then my job was to make sure we get work with the guys like because it was a big team it wasn't just me it was everybody we all worked together but get the cars to the facility get them inside get them washed detailed get them Place work with the various clients and the show managers and get them all inside and that was my job like I I wore all these hats jumping around doing all these and I did it all across Canada it wasn't just here that's nuts and my phone was 24 7. like the biggest thing we did was the Vancouver Olympics and that was tough because this manufacturer was a big sponsor of them yeah and we had thousands of cars there and people running it and I only took care of the small portion of just displays putting cars on displays or any of the commercials they shoot we'd have to get the cars for that and that was a headache because my phone I think that was kind of like a starting of a wake-up call for me because my phone never stopped and I'm like okay there's an end comment so this is before marriage before kids no during this time I was married but the kids were still relatively like wanted I think I had my firstborn that got him and then I can't remember exactly when the Vancouver Olympics was but whatever it was but anyways yeah so then from there just got into the company I worked for really wanted to push us getting other manufacturers because we were just dedicated to this one and so they gave us an incentive to try and get these other manufacturers so there was a sales guy there who would bring them in and I would work with those manufacturers take it from there and we'd do our thing and we would get bonus pay based on that of course and it was really good and so you know I'm like okay fine I'll deal with the sleep was nice because the money is you know I just bought a house um we're having kids so screw it and I'm young I'm just gonna go hard and then one day at the end of one of the tours there the boss comes and congratulates me on hey good job on getting this manufacturer good job I'm like all I care about is the bonus check and he said oh that guy can't I'm like what are you talking about it got canned he goes yeah as of January 1st this is April as of January this got removed like he goes didn't you get the emails I'm like no and so he pulls it up and sure enough in there it said they're removing it but they didn't have me as part of the email so I'm like so I did this whole thing on trying and that was my that was my uh that was my that's it I should wake up that was I was done I that's when I called my uncle right away I like got on the plane I flew home I called him said all right a little sneaky sneaky you know it's just at least give me the heads up right like you don't even have like I by this time I was at this company for so long like 15 years I think it was and you don't have any you can't even just give me the heads up that this is coming yeah right that was one of the things that really pushed me over and the second one which was the biggest was I came home one day and my two-year-old didn't know who I was right because you're gone man that's terrible because we'd be gone from January to April and then then from April you're home for a month then you're on another tour till the end of summer and then you're on a fall tour and then you had December off right so when I was 20 years old best thing in the world like I I literally was in Nova Scotia they had these like roller bars you never have to leave outside I can't remember the name of the strip and I would hit every one of them and then I had to get up get on a plane which was fine I you know I did that till bar closed and I got back grabbed my stuff and went to the airport got on the plane landed in Montreal jumped on another plane was in BC that night and I went right to the bar again just so I can say I drank on two ends of the country in less than 24 hours and I just started going again and I'm like I did it moving on moving on now right that's an accomplishment like how many people can say they did that right no that's actually pretty cool yeah so I mean it was a lot of fun I had a blast and you know it was great times but that one thing really stuck me in the side with what they did it would yeah so and then that's when I got in the trade and then so like all that experience knowledge organization handling all the different manufacturers that I had to work with you know kind of led into this obviously on a smaller scale like this what I'm doing now I don't experience any stress at work people send me into these jobs I don't feel overwhelmed I don't like even if they're bigger jobs I don't feel overwhelmed I'm like I asked for information and if I don't get the information and everything I asked for is either email or text message so I have copies of it if I don't get it it's out of my hands like I don't sweat the small stuff um I've learned how to deal with people a lot better with that job too because we'd have Crews of 20 people we'd hire locally to come in these jobs to help us out right and I had to learn how to manage all those guys I learned that you always when you're talking to your employees don't talk down to them talk to them work with them there's a lot of stuff I learned from from these guys right you know I may only work with them for a couple days but I've learned so much from them and like all the people I worked with there you know they're amazing people and all of them I've experienced um so you communicate with your employees and you choose your battles like if the guy does you know he comes in late and he doesn't do it all the time you know that's fine you just hey man don't do that again right we got a thing to do and that's it some guys will just jump down his throat it's like choose your battles come on but if this guy does it consistently that's different you start the process get your paperwork out and say listen I'm writing you up for this you don't like it you know there's a door there's always a door as simple as that as simple as that right and then you always try and work with these guys because a lot of times there's issues they're dealing with you're not aware about and I know it was a like an employer you're not supposed to care about what their home life is like it affects yeah right so you try and work with the guy so the line of communication organization all that I was able to carry over into here um so I don't really experience any work stress I have you know home life stress on my experience right like especially during this pandemic when they shut the planet down and we're in the middle of doing restaurants and clothing stores and all of them shut everything they just cut the tap off said no we're on hold so then we're all sitting at home like Jesus Christ like what just happened so everybody was panicking at that time exactly right so we didn't know what was going on but um yeah so it just led into being organized being able to communicate with people um being able it was valuable even though they shafted you yeah like I gained a lot of experience like that's the only really negativity out of that place right and then that company I I don't know if they went out of business or gone because there's a whole new company now that came in and took over and I actually went and consulted for them and then I worked for them because I left the trade and went to them for I lasted three months and I couldn't if I was it was similar like there were certain things I want because I actually did love that job they're like you won't have to travel because everything now is remotely you can work locally you know and then communicate on the phone and once in a while fly out these events I'm like okay I don't know how it's going to work but I'm willing to try it because my wife and I we talked about it and it's let's give it a shot so I went there and it lasted three months I couldn't do it I missed this job so much this is like what I'm doing now I don't even consider a job I go in my wife will say you know you go in you play with your tools all day you have fun I come home I'm happy there's guys that deal with that frustration play with your tools I play with my tools all day and you know what I don't um the owner of the company now he's always like Mike how's it going I'm like living the dream that's why I say to them all living the dream because I don't feel like I'm going to work and so guys be like why don't you go to a union comp company or go to ibw go to cost W as great as those places would be I'm happy where I'm at I show up um they give me a job to do I go do it and I go home and with my family I don't worry about anything from work you know people may call me I'm I'm not a dink I'll answer if they got questions and stuff like that but I have zero stress and I'm very happy so important and that was the biggest thing because near the end of that other job too my stress was through the roof I can't imagine my you know I was going to the hospital like what is going on with me I lost I went from I was 200 pounds and I dropped to 160 pounds in three months and I thought I was dying and so I went to I was eating I couldn't figure what was going on and my doctor's like your stress levels through the roof he's like you need to take a step back you know try and ease off and so I ended up just having to leave and so that's and then it changed all the stress now I'm back to 200 pounds man OBC talk Mike wiring and plenums plenum rated ceilings or I'll I'll give you some information you tell me man optical fiber cables and electrical wires and cables installed in buildings permitted to be of combustible construction must not convey Flame or continue to burn for more than one minute or not be located in totally enclosed in non-combustible or non-metallic raceways right so that's your PV that's your PVC question you're talking about that's what it is right right so what you want to do is you want to run your EMT but you have plenum braided type wiring like your cat six and that you can get I think it's ft6 yeah or ft 456 I can't remember which one is white but yeah you're you want to make sure that it can withstand burning also in masonry walls or concrete slabs they can't be in there as well too you yeah you have to run EMT for that right if you're a PVC and concrete I think you can run EMT in slab as long as you wrap it in tape but who's going to do that just run PVC yeah nobody's gonna do that electrical wires and cables within floor and ceiling plenums must exhibit a flame spread of less than 1.5 meters and an average smoke density not more than .15 I have no idea what that means what does that mean I have no idea either electrical wires cables within floor and ceiling plenums must exhibit a flame spread of less I guess if it does catch on fire it can't move it can't because it can touch something else possibly that's a little OBC conversation so Mike this is fascinating man so where where's the future now you're happy with the Sparky yeah so far I like um I was baiting getting my master license I don't I don't know if I'm gonna do that yet because I really have no motivation to do it well I don't have to yeah I'm like like I said like um one of your previous guests talked about um how how when you get comfortable your fear you're facing fear right and so I'm comfortable but I don't feel any fear I just don't want to I don't feel like I need to to move on like I I like the place I work for even though they're not you know we have an rrsp pension we have really good benefits we get paid competitively like um it's just I'm like why would I why would I want to leave there's no reason right I'm doing the small I'm doing the jobs I want to do which are the small commercial jobs I know if I went on my own I'd have to start in residential which I really don't want to do no um I'm happy like uh you know I got lucky I was able to buy my house you know 15 years ago before everything before Madness before everything went to hell right and so um yeah I know like um with one of your guests you guys were joking about I think it was Jen and somebody they were talking about um kids nowadays not being able to buy houses so when you're renovating I think the question you were asking was is Renovations gonna slow down because they were looking out so far yeah and then the concern was well can Young Generation buy houses and then are they going to be renovating down the roads it seems like the only people buying houses now are corporations or landlords and they're not going to renovate or custom that so what's that going to do for us right and I know the joke was kind of like yeah they can't afford the houses but that's the reality right that's just how it is so I got lucky right you did very much yeah so I'm lucky and then I'm like I just uh so I'm doing oh good like I I don't feel the need to have to go off and you know start my own thing right I think you got the secret I think you figured out that you've got a career yeah that doesn't fuel stress that's it I don't like as long as I enjoy doing it yes and even I don't know because my old job I was always under the pressure like we'd have we'd have uh like Toronto Auto Show we literally would have 30 hours to set that entire show up from from our end like display guys would come in earlier but we would show up I had a good friend who was handling all the media on that back in the day like probably 20 years or 15 years ago right we'd always get invite to the Press day the media day and we'd be able to go through right and it's just insane what gets set up in such a short amount of time 30 hours we do Insane man I've done we did um uh there was a uh they had this singer Jewel show up yeah and this manufacturer paid for her to be on the booth and we had to change the entire display for her concert and so we started and we worked 36 hours straight to accommodate all this and then once we were done thing was set up right why did you have to change the whole because the way they the way they set up the display they couldn't have a stage for her to sing on so they had to move the whole display so they can put her a stage for her right which they should have thought of I think got to be four right this is where the afterthought so but yeah I know it was just you do so your days of stress are all behind you now yeah like that was like stress where I'm on these jobs and I'm like man this isn't that bad like like we're only doing half days like 12 hours a day like that's a half day right so I mean it's not it's not like you're doing 20 hours straight so I don't I don't maybe I'm just designed a little differently because I grew up in that pressure and now I don't feel that pressure at all you know if there is sometimes I'll get sent in be like hey get this done quick well also I have a hoard of tools that I know will help me find stuff I need to find right away I know I'm not going to be on uh like especially quoted jobs if uh you know I'll get sent in there and I'll get done half the time and people like well you're gonna take away from your own wages I'm like no the company I work for I appreciate that and they'll actually keep me busy like I just keep going do you think all the new electricians that are coming into the industry are are basically giving themselves stress um I think so I don't know if it has to do with their upbringing like I'm Gen X yeah I was latchkey raised a little differently um a lot of the newer people I've learned I've seen with younger guys where they're definitely used to having a helicopter pairing around them so when that parent's not there to give them direction we're not giving them Direction uh they're lost they're lost and they're kind of stressed out which I don't think they should feel stressed because like the stress should be on me is a dream and not them as the uh yeah but there's structure on the job site and even on yours in in on a good custom resi job site right there's structure right right and so as long as you kind of I guess figure out where you fit in this structure yeah you shouldn't really have stress well a lot of them too like they might it might be more instead of stress it could be more anxiety anxiety right and they're feeling like oh if I don't get this plug right you know I know but then they go outside and start smoking weed they go and smoke a joint and they're right back inside right and then now they're all messed up right and if you I haven't experienced an apprentice smoke and weed or anything like that on the job I'm sure it happens of course like I'm sure it happens and that's how they try and relieve their their anxiety they're taking micro dosing or something right so they're coming in hallucinating right so [ \_\_ ] wiring is not a good thing in dealing with volts and all kinds of no it's not a good the biggest thing I I tell the especially new apprentices I look at them and say this job will kill you if you don't respect what you do yeah you will get killed yeah it's only 10 amps and like all it takes is like .01 amps across your heart and you're dead or one milliamp or something like that in your debt yeah and you know if you don't respect it and you come in here you know Half Baked or something I've never experienced any of my apprentices coming in half big but I'm sure there's guys out there and just that's how you die right one of the things I do also with an apprentice is um I always make sure they get a meter right away and whether it's just like a it doesn't have to be anything fancy test everything and I teach them how to test because you know I could be down in the basement and you're upstairs and um you know it's a split plug in a kitchen and you shut one in the breakers not the proper Tuple Breakers you're only one side of it shut off you know test it double check it make sure it's dead like don't don't get the Tickle tester either those things aren't reliable like that's the last reason I call them tickle test a little pen tester yeah they're a last resort you know if I'm trying to find something GC tester right yeah they can use them right get a meter like our companies out of it like use the meter get the meter learn how to use the meter and that's it right so that should help take away some of the anxiety but like you said like any little pressure it seems um a lot of guys uh there was one Apprentice we had who's who ended up being terrible not guys aren't just built for this job oh they're not designed no and if you're always feeling sweating anxiety like you're he was literally just tying in a box of four wires and just like the sweats pouring and shaking it's like dude you're just tying in four wires like leave it open I'll double check it like it'll be fine right but it's taking all days he's panicking and it's not for you man like if you can't do you got to tell them that at that point yeah you give them their chance but is sometimes you just gotta because it's because not only are they a liability they they could end up injuring like me right as well because they're freaking that's what I've always said it's not that you may not hurt yourself but you may hurt somebody else and then that's a whole other ball game at that point right so is there a lot more anxiety in the younger generation yes um is there a lot more stress when they're coming in possibly like they want to do good and show up that's fine um but the anxiety I think is the big one that I see a lot of and I don't know if it's like Loosely diagnosed now or what there's a lot of guys who I don't know I don't know anything about you but a lot of them are like they're going into electrical plumbing and HVAC the top three right that's what they're going into because of the money I guess the stability money security Union yeah all that kind of stuff right so I'm just make sure there's a time to do it there's huge shorts huge shortage right yeah and so I I know like 20 years ago even my dad used to Hound me he's like you gotta get into the trade it's like stop like get in there he goes there's always going to be issue boom was the thing is all the boomers are now retiring or dying and they're they're the ones staying at their jobs for 40 some years yeah now they're finally getting in letting younger people come in and so now there's this huge shortage in the trades because there's a stigma for a while like oh you don't want to be in trade you want to go to college right that stigma is disappearing I mean it is I know it's disappearing man it is it is and uh yeah if you wanna trades is it top three HVAC but even like I work with a lot of drywallers and tapers and Mudders and I can't taper much save my life I'm envious of the individual trades because you go in you rock and roll you hang drywall you mud to drywall you're out you're done framing same thing like a roofing it's all and JC's probably got the hardest we'll use a carpenter too or GC even you do a lot of you probably have to do everything yeah all right so all of us all you need to okay don't worry I'll take care of it I'll take care of it I'll tell you this yeah a little bit of green book talk before we get wrapping up uh OSHA electrical safety checklist uh you tell me yay or nay I guess but shut off and ground all electrical circuits before working on them that's correct shut them off and ground them out use effective Locked Out Tag systems and label them and label them promptly replace Freight damage or worn electrical cords or at cables yeah these are you most times uh we'll be asked to throw them out but yeah do you yeah but the problem is you throw them out someone else takes them and go look look what I found yeah well what I do is if it depends on where the Frayer cut is if I can just cut and make it into and then you make it another one into another cable yeah ensure that all extension cords have grounding products this is not the famous one this one that always breaks off every time and then they're like well the neutral grounds do we really need three I think we get away with two yeah protect flexible cords and cables from sharp corners and projections yeah try and rip them right by steel studs on the outside and just keep pulling keep pulling keep holding until there's nothing left and then there's all this little fine black wiring or plastic material there what is this who's gonna create electrical thing just wrap her up use three wire extension extension cord set design for hard or extra hard service with portable electrical Electric Tools and appliances look for the s s t s o and sto labels yeah so sow or anything like that they're basically rated for hard usage so it depends on on the tag you know you can have it in like um I don't know like corrosive areas or or something like that it depends on the rating of the cable withstand UV if it's sitting outside all day long that's a big one too yeah where it turns brittle it does so you want to make sure you've got cracks in it yeah that's what yeah never bypass any protective system or device designed to protect from contact with electrical energy yeah so you don't want to sit there and stick a screwdriver in a fuse box to you know let's just put this bolt in here because uh my fuse is blowing yeah hang on let me put my blunt down and I'm just going to put the screwdriver right inside there locate and identify overhead electrical power lines yeah that's normal yeah back to the drywall guys they like making them dance around there but we know what the rules are uh keep ladders scaffolds equipment and materials at least 10 feet from electrical power lines that's a big one uh probably we have to use fiberglass we use fiberglass ladder ladder that's right yeah you guys do yeah yeah properly ground all electrical tools and that are not double insulated never use multiple plug adapters that's correct like that guy over there [Laughter] which one over there I thought you're talking about the one from uh Clark Griswold on Christmas vacation yeah there's lighting don't use that one right what else you want to chat about Mike I mean uh so yeah you got the tools going on yep and uh is there anything else that we didn't touch upon um no I think we uh we talked about pre like I got this little list going here but we talked about like I love that you got a notepad man yeah smart trades working together was one we already discussed on communication with another one huge gc's keeping trades moving forward that one for me is huge because you the last thing you want don't stack three guys stand around man I know right and then you want to make sure they're scheduled right yeah yeah I mean uh site conditions I guess would be kind of what we already dabbled on well you go in even if it's messy clean it up a little bit don't leave it messy don't contribute to the mess I'll try not to I when I go into a place I try to leave it the same way I showed up like I'm residential if I'm fishing wires in their walls I have scanners I will actually tell me exactly where I can drill so if I go in the Attic it will tell me where I can drill through without causing damage and I can fish my wires down I have scope cameras so I can stick it in the wall and make sure I'm not gonna what's the length for the camera scope camera yeah so it's just a little it's called it's made by um uh ferret tools yeah and it's uh it's a ferret plus it's called and it just screws on the end of your fish stick and it's only this big you know it supports off of a Bluetooth signal or something Bluetooth your phone yeah Wi-Fi it goes to your Wi-Fi it's pretty cool yeah and so the camera's on there and then uh it will allow me to fish through unless it falls off and it's so I had to happen to me once where it fell off in a ceiling and uh I'll just have to fish it oh my God no I had to get into I climbed in the ceiling I was able to find an act it was in a um a mall and they had a the ceiling in the store was completely drywall and I'm like how the hell do they get in this thing and I was able to find somebody had already cut out an opening from before so I crawled my ass in there and I got and I found it now because I'm like I ain't leaving this thing no you can't no so anyways but yeah I know I was saying uh it it only fell off because I had the wrong uh because it threads onto your fish sticks okay I had the wrong uh because it has different adapters and I had the wrong one on so after that though I learned my lesson and now I make sure I got the right one I actually ordered some some because you can order more from ferret Plus on their website are they crazy expensive uh no I think I pay thirty dollars they sent me a replacement lens new because it's waterproof so a new Gas customer service yeah summer service it's as simple as that DeWalt yeah it's just like it's just like under it goes a long way yeah it does and leave a bad taste man you're gonna see that chase person never touch your product ever again exactly right so I mean and that's that's what happened with me I'm one person so I just like I the way I operate if I don't like something I just don't buy it I don't go online complaining about it or anything like that I just don't buy it and that's it uh there's no Karen's except now I guess right I'm uh carrying right here you know yeah the world sucks but yeah no carriers and construction no us just Trace people like we're not gonna freaking spend the time and effort to go there and just leave all these bad whatever comments no no yeah a lot a lot of us just don't care we just move on you just move on because you know what somebody else will come along and they'll give you their product and you'll try it and it'll work and then you'll they'll take care of you exactly right as simple as that yeah and the ferret people are really good with me and they just they just told me exactly where to go what to look for and I was downloaded and that's it and then I'm able to scan I can take this thing and send it right down the wall and it had it beeps too if you're near electrical that's clever yeah yeah it's you prefer the fish sticks or the fish coil all right so I have like four different sets of fish sticks all different sizes and I have two different types of fish tape that I use so it all depends on the situation and you know I prefer I have this one that um Southwire makes that's uh glow-in-the-dark fish tape and I like that yeah and so if I'm firing I'll just glue like a stick to the end like tape at one of their South wire fish sticks I have that also I'll tape it to the end of this thing and throw it down the ceiling so I can officially if I'm ever doing data because I also do data so a bunch of stuff yeah and I'll send uh it'll get me to my path on my string but I can see where it is when I go to the other end right because it's a lot of times now I have lights but before I didn't right because so and for all you plumbers out there when I'm talking about fish sticks there's no High Liner logo on it okay that's all I'm saying yeah well plumbers are fish in their packs I know I know but there's always that jab between the three that's all it is I could have chosen framers or I could have chosen brickies 100 and they'd be like what I'm having fish sticks for lunch today that's what I'm having no no no it's different I'll bug the plumbers man I'll see them come in with a broom and I'm like what's that thing isn't that with the white ride then you go home your wife punches you in the face yeah why'd you say that he's such a nice guy and his wife is lovely yeah don't say that you're picking fights at work now you're supposed to be at work having fun with tools no her and I get along well we make fun of each other it's all good that's funny man the best thing is uh one day I'll tell you this quick story yeah yeah where we were bickering each other at the dinner table and my father-in-law is very old school and so she gets up goes in the kitchen and he gets up follows her into the kitchen it's like I don't like the way you talk to Mike he's like he's a man of this house you just created more problems she's like I'm your daughter you're making fun of each other he's like you shouldn't be talking like that you know you should have more respect for him it's okay so yeah no oh that's funny Mike thanks so much for coming on the show we still got the 12 questions um well on Instagram it's Mike's underscore tool underscore fun that's correct and then you're gonna start expanding that and doing a lot more fun I'm still Blown Away by that client man I gotta check that out as well Advanced circuit tracer et450 I got a few videos on YouTube with it some on Instagram awesome yeah ready uh you ready for the 12 questions go right ahead what is your favorite construction word so my favorite construction work would be Innovation new ideas design so anything that can move us forward whether it's technology or anything like that when you're on a job site and you know anything that comes up with that's Innovative you know I like that what is your least favorite construction word this is impossible I can't do it I don't like that figure it out come on like uh one of the top problem solved Solutions like stop with uh I can't do it and just come up with okay what can we do exactly right don't go to the clients if we can't do this because the first thing they're gonna say well what can we do well you go there with a couple of solutions right we can do this this and this here's why we can't do it let's do this it's true right Solutions what turns you on in construction uh biggest thing uh obviously the use of tools but finishing the projects like I am one of those dads that takes the kids and like there's these apartment buildings in my area that we did from ground up and I'm hey man I was I was on these buildings I wasn't there the whole time I was only there for a couple of months some guys were there for two years oh yeah I'm like it's a proud thing and even my son who's like 10 years old like my dad worked there like finishing projects what turns you off in construction um lack of communication between the trades we're all there to work with each other we're all there in the end to satisfy the client and our goal is for the GC to bring us all back on the next project if we're not working together we're bickering and fight fighting geez he's not bringing you back he's not bringing you back he has to retail retool the team that's it and and the client like because I all do a lot of commercial these guys might own more than one facility but I don't want these guys back right so it could cause problems for the GC as well just communicate work together like there's no reason why you can't the plumber like I hate when I run in the job sites you got HVAC and plumbers electricians all fighting each other like I look like don't call me until dead last because I can work around the HVAC I can work around the plumbers but you know like in this where we're doing these stores now I work very closely with the plumber I'm like hey how are you going to do your stuff and then I'll work around you because you're giving yourself shorter days now way sure by doing that yeah way shorter then you can have more fun with the kids and personal 100 what's your favorite curse word or phrase uh my favorite uh curse word phrase it would be [ \_\_ ] the [ \_\_ ] say what's your favorite vehicle of anything in the world so when I was in my 20s I had a 1987 Monte Carlo SS oh that I had um a engine built for it through uh they're not around anymore it was Terry's engine Center that's a nice that's actually a nice shape man yeah it's I love the choo choo front end um it was my Sleeper Car and um you know I'm not gonna admit to racing but you know we drove it hard you drove it I drove it that's it yeah easy Cruise you know t-tops exactly I miss that car very much one day yeah maybe one day we'll see I'm kind of looking lean towards now uh I want to get a Fiero as a project car for my kid to do because it's small which year first or just second generation so the uh well basically from uh 84 to 80 86 there was the same car essentially yes citation front end and uh Chevette back end or the other way around yeah and uh 88 is the only time they actually revamped the entire model I would love to get an 88 with the t-tops they only made 614 actual factory made T-top 1988 Fiero GTS I love the fly I found a couple but they're they want like 25 grand for these things because they're rare they're rare they only made them for six months of that year and then GM just kiboshed it yeah GM's made a bunch of great moves like that so I mean I think it was because they had like the Buick related was also a two-seater they had yeah uh the Corvette as well and I'm pretty sure the Corvette dominated them all and said get rid of those cars kind of thing right yeah in my theory but yeah favorite car 87 Monte Carlo West says least favorite vehicle and you think Dodge I cannot stand Dodge everything died I hate Dodge like even like Plymouth so the New Yorker with Corinthian leather that kind of thing yeah I like the old road runners and that I do like those like from yeah back to the 70s 60s right I just don't like anything with that monster tail on the back right yeah well I was always a GM guy as well but um even even now I'm kind of like like I have a I drive a 2006 Colorado that I bought brand new in 2006 and I still I take care of it it's got 98 000 yeah take care of it but yeah Dodge is my worst what construction sound or noise do you love my I love when other trades are not there just the quiet so what I I'll try and do sometimes is I'll try and go into a site a few hours before knowing when yeah before the audio shows yeah and then I can get way more done and then it's quiet and peaceful that's just the way I am right I can throw my earbuds in and just listen to some music and not worry about some yeah Groove yeah no yeah this is it right like I get it I do get into a Groove and I find myself like I rarely take lunch breaks because once I'm in that Groove because I'm I'm not I'm having fun I'm legitly having fun people you need to take a break and like screw that man I'm going good so but anyways yeah you get you're right Groove that's it what construction sound or noise do you hate hammer drills SDS drills pounding concrete it's like the endless ringing in your head right I cannot stand that what profession other than your own would you like to attempt one day so I would love to do um if I were it'd be a mechanic on classic cars so that Monte Carlo that I had the engine built for I'm the one who did the engine swap in it I'll all the work on it I had a Cavalier before that that I completely tore the engine down and built it and now I know it's very basic and very still I did a lot of the Haynes handbook that you used to buy from the entire right I had fun doing it I enjoyed it so um if I had to choose a different career I'd probably take a mechanic on classic cars I don't want to work on people's cars I don't work on it I just want to work on that classic I want to work on your cars yeah exactly there you go that's all right what profession would you never want to do oh plumber of course sorry plumber just digging at you nothing wrong with being a plumber I just like making fun of them and they make fun of me they drive all the Porsches man that's what plumbers do exactly last question smell is money right that's exactly it man If Heaven exists what would you like to hear God say when you arrive at the Pearly Gates so I show up there and it's uh fridge is full of beer got tacos and steaks and nachos all laid out just take a rest before you see your family that's it yeah drink my beer eat my tacos and nachos and endless supply before I see the family that's it yeah nice man yeah pleasure Mike thanks so much yeah I appreciate it thank you man very much everybody check them out on IG it's Mike's with an S underscore tool underscore fun enjoy so yeah I like that you're seeing a whole bunch of positivity in the trade business man that there's no stress for you man which is great yeah like I I think everybody plays their part and I think every one of them is when people ask me what's the best one I'm like there isn't a best one for the trade pick what you feel like what did you like doing growing up and stuff like uh like woodworking is my hobby right and I've done a lot of stuff but electrical is just like this is where I have the fun and I get in there and this is for me it was electrical this is I love figuring out there's a lot of math involved the circuits like I love all that so I'm terrible at math but I don't care it's it's challenging right and that's what makes it funny you're very smart at electrical math yeah if it's not challenging for me I can't I can't do it I go brain dead so so I got one last question what's the one Star Wars question should I ask you go ahead ask me I don't know what should I ask you are we a fan of the new ones do we hate them okay so the way so the first three that came out in the 70s were the middle of a story of course part four five six I must have watched those movies several hundred times of course I've had I've worn out two sets of VHS teams worn out my DVDs this and I have Blu-rays that are pretty much on the way up the door the prequels were made for children and that's that's how he made them and I thought they were good I really liked them and my favorite one was the third one but I had to put myself in that mentality that this is a child this is a children's story right and I thought it was great the last three I felt were the repeat of the middle three yeah I thought there was nothing new nothing new they just took nothing creative and then the Mary Poppins thing that's what killed it for me I'm like this is all three I've only seen the last three once each and I can't watch I've seen the middle three countless times yeah maybe I've seen the first three once or twice or maybe third time that's about it I'll probably Revenge of the Sith I've probably seen it the most out of other three of them but yeah I can't watch these new ones I just don't like what was done it was almost like a corporate stamp was put on it and just do what was already done and we know it worked yeah so keep on doing that yeah well one of the branch off movies Rogue one which was really good that was real I thought that was probably a better one out of the whole thing yeah and it was a good way to kind of tie everything together and you can't go wrong with that last scene that kind of ties right into part four right exactly and it was and I thought and then but I haven't really I tried a like a Mandalorian a series I can't watch it really I can't go past it I tried half an episode I tried to watch Andor I try to watch indoors I couldn't get in but I've got such a Negative light when it comes to Disney yeah I'm the same way I don't I don't I mean I understand what George did and you know selling it but I think that he probably would have been better if he sold it to somebody else I think so too yeah well he was in his 70s too and at that point he was like I'm done with it right yeah it's just that's it new generation but it's not it's not fair to us the fans you should have tried new ideas yeah you know what I mean yeah it was all new ideas back in the late 70s and early 80s there was plenty of new ideas there yeah and they didn't try a single new idea no they they repeated exactly the same yeah and now they're just doing it they're kind of working off of it's money everything comes out what it is perfect man no thanks so much Mike I really appreciate it man uh all the best to you dude all right we'll talk soon take care we out of here [Music] foreign [Music] [Music]"

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"VideoID": "834",

"Title": "Fishing a 50’ gap #sparky #electric #trades #electrical #shorts #tools #work #fyp #construction",

"URL": "https://www.youtube.com/watch?v=IGFDtzseUX8",

"Keyword": "Commercial electrical construction",

"Transcript": "but there used to be a time when we had two groups of people you have people who know [ \_\_ ] and people who don't know [ \_\_ ] and and back in the day the people who didn't know [ \_\_ ] respected the people who knew [ \_\_ ] and you would be in a situation it might be work or social situation and the people who know [ \_\_ ] would be talking about i know some [ \_\_ ] yeah i know some [ \_\_ ] let's talk about [ \_\_ ] we know i know and the people who don't know [ \_\_ ] would kind of hang in the back and they'd be quiet and you'd be like well why aren't you talking i don't know [ \_\_ ] i don't know [ \_\_ ] i'm uh i'm gonna keep my mouth shut i'm gonna try to learn some [ \_\_ ]"

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{

"VideoID": "836",

"Title": "slabe pipe || electrical #trending #youtubeshorts #electro #electrical",

"URL": "https://www.youtube.com/watch?v=fx0USdfksmY",

"Keyword": "Commercial electrical construction",

"Transcript": "Jerusalem area [Music]"

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{

"VideoID": "839",

"Title": "Surrey Tech Services. Commercial Electrical and Fire System Installations.",

"URL": "https://www.youtube.com/watch?v=BRqDgmnTjo8",

"Keyword": "Commercial electrical construction",

"Transcript": "foreign [Music] Tech have made our last two projects a dream for us and for me personally to run it was sort of a no-brainer for us as a business to you know who we were going to use for our electrical services on site I'm Bernie I'm one of the project managers for sorry tech services my main role is to look after the electrical jobs that we have ongoing with day-to-day on-site running looking after the guys making sure everything is going to call the plan sitting in with the the client and the contractor meetings to make sure everything's going exactly how they need it to be the way in which we've been involved with Surrey Tech is we met them through another contractor that we've used on our previous projects we've then used them on our last two projects and then they've done those two schemes brilliantly for us it's been a very enjoyable project to work on it's been quite full-on very in-depth and there's been and then working with other contractors it's been yeah it's been going well it's been very enjoyable it's just easy to be you know to work with people that you enjoy working with you know um and it's been one of the better parts of working with them for the last one nearly two and a half years going forward as a business as you know available as a business sorry tech services are definitely coming along for the ride with us you can see that they all value each other higher than just he pays me sort of thing to me he's like a really good sign that it's a good person you want to do work with"

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{

"VideoID": "840",

"Title": "Connect The Ground &amp; Neutral Wires #electrician #electrical Commercial Electric",

"URL": "https://www.youtube.com/watch?v=ZQOTvsXtrKo",

"Keyword": "Commercial electrical construction",

"Transcript": "all right so here's our new meter base right so we've got the black wire and we use blue phasing tape because we did not have any red and this is our uh grounded wire um coming this is going to the utility feed that bar is connected down here so you got the ground going to the ground rods right we've got our grounded um wire you know and or the neutral and the ground ding conductor um which is our ground wire we used copper on this job because this is a commercial setting okay and when you do your load calculation you have to rate that at 125 percent and or contiguous Duty"

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"VideoID": "842",

"Title": "Superior Electrical Construction",

"URL": "https://www.youtube.com/watch?v=yL-BTRJ4BDg",

"Keyword": "Commercial electrical construction",

"Transcript": "what you'd love what you do you'd do it well the people at superior electrical construction really are in the industry because they love it because they've been brought up in a family tradition of hard-working and honest electricians I've been involved in the industry for over 30 years I was lucky enough to be indoctrinated into the electrical industry at a very young age in 1929 my grandfather became a union electrician well subsequently my dad my uncles all my cousins are all Union electrician so I was literally born into the industry with this type of tradition it's easy to see why superior electrical construction does higher quality electrical installations than anyone in the business superior electric views ourselves different from other electrical contractors in the sense that we feel that we go above and beyond what you contract for us incorporated in 1976 superior electrical construction has seen and done it all we are a financially stable company with an excellent D and B rating plus our staff collectively has over a century in the industry and we require our employees to have extensive training and experience they spend five years classroom training five years on-the-job training so there are some of the best trained electricians in the industry one look at an SEC installation and you will know that the quality of our installation is superior there is no spaghetti mess of tangled cable everything is neat and organized so that many years from now anyone can come back and know the layout the thing that sets us apart is our attention to detail our willingness to go that extra mile for the customer the kind of quality you get with SEC goes far beyond the physical installation we strive for 100% accurate billing we identify problems before they happen we will make the schedules help you make the drawings and finish the project within the budget and on time many times there's a slippage and scale weather-related manpower related many many things affect a schedule our goal is to jump all those hurdles we've made every date that we've been asked to make safety is obviously important to any project but SEC takes safety to a level beyond the standard industry required safety practices instead of having the required weekly safety meetings we have daily safety meetings and SEC is constantly working to improve our safety practices even further through continued education data and experience our main goal is at the end of the day our employees and the people that are working around us have that ability to go home and be with their families the worst thing I could ever think of having to do and and thankfully I've not had to do this yet is make a phone call to a wife or a husband and say your spouse has been in an accident as real people with a real heritage in the industry part of what sets SEC apart is integrity and honesty there are no hidden agendas we just want to do the job right for you and for us as he sees integrity the second to none we constantly strive to be above board with everything that we do people know that you know what this isn't a regular contractor who just in here to get the money and go they want to come back they want to keep doing our work and they're gonna be honest with us and tell us the good in the back we are probably one of the most transparent contractors that that you can find we will leave you feeling like you want to superior electrical construction wants to give you the highest quality safest installation possible so that you'll want to call us back for all of your electrical installations repairs and upgrades so visit our website or call us today I gotta taste I truly think I work for the best electrical contractor in Kansas City people actually care about each other people actually work hard for each other and it doesn't matter what position you're in everybody wants to help and do the right things and you just don't find that today you don't find it anywhere and I I'm honored to be a part of"

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"VideoID": "844",

"Title": "New Milwaukee tool and site box setup for electrical construction",

"URL": "https://www.youtube.com/watch?v=rFe3\_BASCZE",

"Keyword": "Commercial electrical construction",

"Transcript": "hey what's going on guys so as you can see i've got a fair bit of my stuff out at the moment i was just reorganizing doing a few bits and pieces and getting set up for a big job that i'm starting in the city so i may as well take you through my setup at the moment so you'll see in the back of the pajero i've got from armaguard this is the tough bank it's a fairly large side box you can see it fits into the uh pidgeot sport which isn't a very large boot so that'll be my new setup for work for all the tools it's a fairly big site we're going on i'm going to be there for a while hopefully so as you can see i've got a lot of my gear out i've just been going through all the um old fixings hole saws all that sort of stuff figuring out what i can do and you can see i've got the dewalt out i've now moved that over to a pack out i'll be taking the roller box the one with the packable front on it i've done another post on that little beast of a accessory that one is for something that's coming up in the future for instagram and youtube the rest will stay out i will be taking the new tote as you can see i've moved over from the bags i got this one for free from a mate and thought i would give it a go been trialling it out for the last week and it's been really good actually i'm quite enjoying the tote life so and you can see i've got the light out that's the milwaukee pack out light that one i'm taking just for a few fixings and that that i've got to carry around on site and as you can see so this is where the dewalt laser went to as you can see it fits in there nicely i'll be doing a whole post on this phone this was literally picked up for eight dollars here in australia at clark rubber so it worked out really really well there's not too much to choose from over here in australia especially at this sort of size this is uh what is it 60 50 60 yeah 60 mil so i would like to go to maybe 70 but at the moment it's actually sitting pretty well so that cost me about eight bucks to put that in you can see it's fully solid same thing for the hole saws i moved over from just a box full i did a massive cull and now this is sort of what we're sitting with i'm going to look at getting some centers for these just to hold them in place a little bit better but as you can see easily accessible but if we close this up you're not going to be losing anything anytime soon so it's nice and comfy in there that worked out really well so then when we come to the roller box it's just a few bits and pieces got my hard hat gloves in there just a few locks so one of these will probably going on to the box um on the site box just got drill bits and bits and pieces in here this one as you can see there's just not enough room in the car at the moment so i've had to take it off but that sits there on the front that's from 48 tools if you're looking and this one's from packable i've done videos on both of these just got my drills drill bits uh lock our kit in there blow torch i've been rocking the mp1 still i did go to the tb tp3b for a little bit but now that i'm rocking the tote this is what i'm sort of carrying around just throwing the tools i need for the time but also we've got just some more safety gear got the hearing protection and just a square if you haven't seen this it's pretty cool if i can do it one-handed so that folds out makes it 300 square it's not a bad one that's from lufkin from crescent so they'll go in there and that's basically the setup so that'll all be locked away nicely in the tuff bank from abergard and we'll see how it all goes fingers crossed"

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"VideoID": "845",

"Title": "Make Commercial Electrical Work Easier on Yourself",

"URL": "https://www.youtube.com/watch?v=QXkm5XceGRg",

"Keyword": "Commercial electrical construction",

"Transcript": "and here goes [Music] hey it's Joe wolseman CEO and master electrician of Jefferson Electric you know what a lot of electrical business owners want they want their skill set to create active revenues that they can then reinvest in commercial real estate or residential real estate for Passive revenues and that is what we've done here behind me is Jefferson Electric hq3 you might call it two or three depending on the day because we're really ashamed of hq1 and we don't talk about it very much and then we moved to a nice decent garage there and now we're in here but we've relocated over a year ago to the new facility so I've got a floor coverings specialist that moved in see on my left here is Goldie that's Brandon check out this video here cool things Brandon's doing we ran some commercial 20 amp circuits form then on the right we've got Martin Martin is a floor covering specialist let's get inside check out his jab and get started because time's ticking I'm using my vde tools because we are going to be working on energized circuits today in addition to all the standard stuff that I'm usually toting in the trunk of the Tesla I've also got a Tasman tester in fact I like it so much I've got two I'm like legit impressed I'm gonna show you this later but this is probably going to be the the multimeter that I put in the hands of my two oldest Sons this is 12 bucks on Amazon and it's going to do everything they need to have done so I'll show you that later put it in the pouch and then I've also got a Southwire MC stripper dude I despise I personally this is me this is not the gospel of any sort this is just me I despise working on MC cable without a proper rotozipper I just hate it feel free to disagree what practices do you employ for working on MC cable hey to each his own do your thing bro this is my thing when I'm tackling a varied job like this I've got a basic three-step process number one is understand present condition number two is tear it down to the basic forms everything I don't need boom boom gun eliminated demo and then number three build it back up understand tear it down Build It Up that's the approach if you've got a different approach let me know in the comments but what I'm really interested in is a synthesized nomenclature that you can give to an apprentice because if you're doing training if you're working with somebody else you've got to like a guy like me I want to see the big picture I want to under I don't want you to just give me an individual task so if you can look at The Apprentice hold up three fingers and say understand tear it down Build It Up and give them the structure of their day the structure of the approach that's really really helpful to me so what's your structure how do you communicate with your Apprentice actually before I get started next Thursday I'm going to take a house offline I'm going to rip off their 200 amp service literally pull it off the house and we're going to rebuild it on the garage and go underground and refeed it we'll have utility coordinations we'll take the customer completely offline we'll be without power so we're going to have two portable batteries the one we're using and the one we hand to the customer for their convenience inside the home so before game day I've got a new ecoflow product I'm going to unbox it right now plug in the solar panel charge it up usually this kind of battery is shipped lithium batteries are shipped around 50 because that's the best resting level for them and so I don't want to be in a Lurch on game day I got to get that prepped let's check it out real quick and then hit the jab I want to call out some of the specs and instruction manuals real quick it's got the quick start guide which is super illustrative this is a I mean these things are Plug and Play do not be intimidated by a portable battery this baby weighs 50 pounds and I'm going to tell you this is like the portable job site battery for Jefferson Electric one it's only 50 pounds some of the bigger units which I really like for home energy storage and check out this video here on the boss battery but that that's a hundred pounds we we dove into that one and it's super cool but 50 pounds and check this out capacity 2048 Watt hours with solar regeneration which I'm going to show you here in a minute it's pure sine wave that means the power you're getting from these lithium portable batteries is spot on it's not dirty power like generators it's not going to cause computers and other stuff to wig out and absolutely Freak The Surge capacity of this thing is 4 800 watts that means like if we had extension cords and two or three tools plugged in simultaneously to this beast and we're running like core drills angle grinders like it's going to operate them it's gonna it's gonna manage that situation which is fantastic so we don't have to stop pause hey like you drill that hole you sit tight you grind that down you hang time also when you illuminate that the USBC power port is at 100 watts per Port highly impressive that'll charge up your laptop at the same time you're core in a hole it has over voltage protection overload protection over temperature short circuit low temperature low voltage over current protection that's something that your generator can't boast that generators are a hog right you just love filling them with gas and letting them run all day but they stink up your cab they spill on the floor of your cab so it stays stinky for months it's hard to clean up they create a ton of noise so it's hard to communicate on the job site and um all in I'm a fan of lithium portable power doing illuminate two more things one ecoflow has an app so you can get in-depth insights on your mobile device into everything that's going on with your unit oh oh beautiful travel case oh 220 watt solar panel that is gorgeous okay and I broke it nah they're more durable than that I'd be all right bro here are the PV cables exactly what I expected and it's nice in that these are mc4s positive and negative those are standard solar industry connectors and so if you had to figure out something else rig up some additional power you'd easily be able to you or your local solar contractor let's just set this thing in the Sun and see what it does so this solar panel is 220 Watts which is impressive for its size this unit will accept up to 400 watts of solar input it's a folding solar panel look at that oh gorgeous we've got 125 watts Sunshine cranking into our battery look at this the carrying case it's got these little carabiners hooks on and it literally that's stiff and it is the support for the solar panels to hold them at a 45 degree angle that's pretty cool these are bifacial solar panels which means that you've got some kind of like Gorilla Glass on the back side too not some weak sauce paper and so that's that's durable it's got a little flexibility to it all wraps up tidally in the Eco flow pouch I'm charging 185 Watts on my Dewalt 20 volt Quick Charge 125 solar replenishment this is pretty cool pretty cool roll out a couple more mods 400 400 watts total stack a couple more batteries and just go off grid it's time to tackle the project let's figure out what we got going on here and start ripping ripping things down first thing I notice is a expired conduit up here pull that out we're not doing anything that does not help us achieve our goals we can put it that way oh I'm interested in getting into here this conduit gets deleted oh in fact look at that it was barely supported fairly supported this box is live that's Warehouse lights all the warehouse lights right there keep those crankings so Martin can be productive but let's just take a peek inside the boxes stuffed and loose this switch is going to be replaced with a 20 amp commercial switch and that'll be the break room light down here uh uh not only is the Box loose but it's completely unanchored okay definitely going to de-energize to accomplish that pull the conduit out probably oh look at me talking to the electrical code coach later on this video and I've got my first question for him it's actually a debate that we've been having in the office here for a little while we've got people on both sides both sides of the line is going to be a good one stick around for that it's gonna be a good one okay so we know what's going on there this is not supported yeah awesome see what's going on up there but we are right upstairs above the electrical panel Tim lower right breaker second floor lights can you shut that off boom see The Testament one of the things I love is that it's got base functionality voltage DC voltage AC it's got resistance um audio but it also has non-contact voltage detection which is sweet and flashlight this thing's slick so always be mindful you could have one more than one circuit in the box that's why I like to you know just because the lights went off doesn't mean that this box is de-energized but that my friends is that turn off my flashlight this thing will Auto time off or you can use the power button and it's so compact look at the the size in relationship to my hand thing is slick that's slick it's just a good little entry level meter good job testman all right let's cut some zip ties off make sure we know where all these cables are going I'm going to pull them down we've cleared out the wiring up above now we're down below but I wanted to pause real quick and say Tom Corey our camera guy behind the camera you guys don't get to see him but he is one of the most encouraging supportive people that you will ever have the privilege of working with I show up late I'm running tired hassled upset jobs not going well Tom's standing by with Karen support he's understanding he helps Drive things forward guys high five him in the comments below if you appreciate what we're doing here Tom Corey man behind the camera boom so now that we're down below I think I've isolated this right here this is the home run back to the electrical panel I'm not going to rip out that whole circuit I'm just going to re-label it I'm going to box it and label it and leave it right up here for future use um that's not gospel right there that's just slight preference I could go ahead and pull the whole thing out but I think I'm just going to strip it back terminate it box it leave it and then I'm going to utilize the existing circuit over there to add the new break room light right here and I've got some blocking we'll make sure that's supported and it's screwed in there it is yeah it screwed in two screws on each side so it's super solid and we'll find the center of the room which it's it is Center so I think this is working out actually in our favor it's going really fast we'll have to find more work to do today what's going on here is we've got a 400 amp meter cabinet outside it's a CT cabinet feeds into this 200 amp main breaker cabinet then it also from the 400 feeds to this 200 and this is the disconnect for the adjacent space Brandon space and again if you haven't seen that click the video here let's see he's got a cool thing going on there let's go ahead and use our Southwire RotoZip and terminate this cable so guys this is what this looks like first let me show you what you adjust the knob here to fit the size cable you're using so you don't just use 12-2 with this but it's also compatible with 12 3 10 2 10 3. at some point you're gonna you're gonna size out but I'm not sure off the top of my head I bet you could use 8 gauge MC cable so you just take that handle you spin it around you can tell when it the resistance disappears I'm through the jacket so I release because that's my cutting wheel right there I'm engaging when I squeeze that down I'm engaging both the PIN to apply pressure to the cable and hold it in place then also the cutting wheel with that little action right there and I'm spinning the cutting wheel with this handle so that's all that does then you just pull and twist boom remove that inside paper usually it'll break free insert your anti-short bushing a lot of guys will love the more expensive connectors that are don't require a separate anti-short bushing and that bushing is not code it's just best practice number two square drive open up that connector so this is a low-cost higher labor connector but it's pretty versatile it's got a broad range of acceptable cable and I'm only using a couple today so that totally works slip it in there you want to see that that red anti-short bushing see that red flag that's the bushing it shows me it's fully engaged tighten down that connector never death grip your connectors you'll actually could short the cable internally spin that lock nut off punch it into the side of this box guys I don't know if you've seen it or not but I've got one 48 minute video out there and it's a great video there's so many things to like about it but it's on electric vehicle charging and it I forgot like the ground screw is sitting right there and I just totally well I'm chatting on camera totally forgot to terminate my ground wire to the ground screw the ground and metal box that video has over 2 million views you want to know what the number one discourse in the comments section is hey he forgot the and you can't respond to everybody there's no way hey you forgot the ground screw he forgot to ground to the ground screw hey he forgot to ground the Box hey code requires hey he forgot that I think I responded the first like 15. like you're right you're right Humble Pie not gonna Dodge that one you're 100 right you're right you're right you're right you're right now the owner of that channel went back and corrected it and if you want to see that video it's it's pretty good video start to finish electric vehicle charging check right here so what I'm going to do is I'm going to ground my box first thing I almost always deal with my grounds first right so using my South wire seven and ones these things will needle nose pliers strippers cutters thread Cutters I'm just gonna strip that oh I do a mid strip heck I know some of you really don't like the mid strip good strip and strip I'm set up for the next wire that enters this box a wiring at those so they don't if they become energized don't short against the side of the box all right connector is tight tool tight in fact this is a four square box also called a 1900 almost done but not quite grab two more little drywall screws and some Jiffy clips all right man even just a basic function like that it's nice being wearing gloves you know why you might slip off the screw have you ever drilled your hand when you're bearing down on a driver with a blunt force bit like that ah that is excruciating then also if that Jiffy clip catches and Spins it becomes a knife and you're going to be thankful that you've got those Kevlar cut resistant gloves so I'm a big fan of gloves and eye protection like every job all the time I'm just missing one glove today it like threw away my old ratty pair that you guys been making fun of that's missing the fingertips and this pair is not a pair so that is on my list when I go back to the shop okay it's time to label both box and breaker as spare and wear use my fine tip Sharpie for that and that is circuit number uh how many circuits I have four is this a 42 42 yeah or 40 in this case plot and you one for that poor handwriting poor me Perry I am so glad I mean you are the electrical code coach you're the kind of resource I need because I've been an electrician now for 17 years and I would say probably every three or four jobs that come up against a couple different things and I'm like that could be nuanced I wonder if this is best practice that I'm confusing with code or wonder if this is a code minimum standard I wonder if there's Merit in increasing above code minimum standard here what's the job cost what's the customer value like there's so many questions and all valid questions to be asking but the fundamental question that I'm asking you here today on this job is first can I run MC cable in a warehouse like this below eight feet where in our jurisdiction that's going to be considered subject to physical damage now I don't think correct me if you see differently I don't know I don't think that if I run back here on the break room wall that it would be considered subject to severe physical payments but then in the warehouse well they'll be operating a forklift would that be considered subject to severe physical damage and where is the Tipping Point with your typical 12 2-2 Southwire MC cable off the shelf from Home Depot what do you think what what's best practice was code minimum okay so this is a great question and this is done uh unfortunately one that's absolutely going to be up to your ahj your inspector but I'll give you my thoughts on it so the when you get over to three uh 3 30 and you get into 330.12. now anytime we're dealing with a conductor cable or conduit we're gonna head over to that specific article and we're going to head to the dot 10 and Dot 12 sections first so when we get to 330.10 it's going to be uses permitted for an MC that's going to let us know everywhere that we can use MC and then MC actually has only a very short list in in 330.12 which is going to be where we cannot use it and when we get to part one we're gonna find out that it says subject to physical damage it's not allowed to be used it's not permitted we're subject to physical damage so in this case it doesn't say severe physical damage at least in the code book that I was reading in earlier which is the 20 in the 2020 version you said that you were on the uh the 08 in some of our previous conversations but with that being said physical damage and severe physical damage it's going to come down to really practical like you said out here in the warehouse definitely going to be subject to physical severe physical damage in my opinion MC however is not allowed to be subject to physical damage at all and that's why the code has left this really big and I'm glad that they have because it's really going to be up to your local electrical inspector do I think in the break room it's subject to physical damage maybe probably not depending on where it's at do I think out in the warehouse is subject to physical damage I do absolutely so it's all going to come down to your local inspector and you may be in one County he says yes you can do it exposed in the break room you may be in another County and he says no that you cannot so I wish I had more of a you know a finite answer on this one but it really is going to be subject to interpretation I would say in the break room you're fine but I would like I tell everybody oh we check with your local electrical inspector boom that is a magical answer the ahj is the final Authority now let me ask you a couple fundamental questions and I'm really probing here um this is not a code question per se but it's a code approach mentality I have to fully admit when I'm approaching the code I'm looking for permission to get work done I'm not really approaching it with restrictions so sometimes what I think is the code actually contradicts itself because it's a compliment complex document that's been produced by thousands of people over the course of years iteration situations lawsuits and litigation of all types right so I think sometimes sometimes there's some some holes gaps and some um nuances um would you agree one that the code does have some gaps contradictions and some voids of information at times absolutely it does and anytime you have people involved you're going to have errors you're going to have mistakes you're going to have oversights you know a really good example is here in the 2023 code you know we're really diving in into it now and if you go to article 100 that's where they've moved all the definitions well when you go look at the definition of a permanently installed pool they've removed the height Gap I believe it was 40 greater than 42 inches would have been considered a permanently installed pool well if you read the definition now they have completely omitted all above ground pools so all above ground pools no matter if it's 90 feet tall and surrounded by block and brick if it's above ground it's not going to be considered a permanently impulse installed pool meaning you don't have to bond it you don't have to do all these things so it was a big goof up by the code making panel and it's something that they're definitely going to have to fix in 2026 and I really look for them to do uh you know in between amendments to fix that now wow okay so you said in between amendments flesh that out a little bit how many amendments and what does that look like does a code undergo any particular code cycle on average so they do when they're really suspicious things that really big boo-boos in the code making process they do an interim Amendment meaning that it's code right now and a really good example is in 2020 when they started requiring GFCI protection for all outdoor Outlets which included HVAC equipment well unfortunately down in Texas there were some people who died because of this it tripped GFCI trips somebody died and they said oh my goodness and the reason is is some of the units some of the older units and some of the newer units they uh leave that four to six milliamp threshold and they trip on those AC units well they had to come in immediately and make an intern you know I can't kind of I think it's a TSA or tis I'd have to think about that but um it's an interim Amendment it's in between the code cycles and it becomes code immediately and they allowed you to not put GFCI protection on it until a later date and then even in the 2023 they expanded again out to 2026 to give the market time to correct and to be able to make it so these HVAC units do not trip on this GFCI protection and unfortunately like you said before uh with many people and lots of codes and litigation there's usually always a body count when it comes to a code change especially when it's one that's done in between Cycles because something Extreme has happened and they've had to step in and you know they've had to step in the course correct wow so HVAC equipment tripped out temperature rise inside the house and probably some elderly or or maybe some infants were tremendous wow yeah and that's kind of the extreme version but that's the kind of stuff that happens I do look like I do look for them to make an amendment on that pool bonding because yes it would not be uh on the definition of permanently installed pools no it would not be an immediate death but you're talking about thousands and thousands of pools that are going to be installed and not have to follow all of the requirements laid out there in 680.26 680.23 and so on so I look for them to change that pretty quickly it doesn't seem like a legitimate contractor would see that and uh intentionally take advantage of it however I could see that somebody could accidentally fall into that who's not generally informed and just looks at that one specific data point and I wonder how many pools right now are not properly bonded as a result of that you know maybe not as a result of that yet because that's a new change and they may not even catch it these pool installers they just kind of go do the same thing rinse and repeat so they may never catch that code but it's out there and if there's a contractor who can save a nickel and try to that's why you'll see small changes in the wording of some of these codes because somebody does push it to that extreme Edge right but hopefully nobody even notices and they just keep installing them like it is a permanently installed pool so yeah okay so I really appreciate that another fundamental question I started fleshing it out is I'm looking for permission rather than restriction how do you approach the code do you have a mindset absolutely I do I want to win in life and I want to win in business and the code is set up as the rules right like if we're playing football or basketball it's the rules that I have to play by listen Joel We want the buy-in to the electrical table to be very high we want it to be hard to get your license we want it to be hard not not hard but we want the buy-in to be high we want it to be costly because if not anybody could be at the table right and then the reward is going to be less the pot's going to be smaller with that being said that's how I look at the code I want it as close as I can get it to the code because if I don't and something comes back on me later it could deter me from winning tomorrow I'm doing the things today that caused me to win today and don't stop me from winning tomorrow so I just want to know whatever it takes to win and it's not winning at all costs you know there's two different types of winning there's winning uh you know because you're better than somebody and there's winning because you're bitter and you just got to be one of those people who win because you're better and I'll just keep you know becoming better and better you know so I can continue to win I love it man you've got to be future minded really well said wow okay so another code question here keep it rolling MC cable am I required by code to utilize anti-shore bushings in my MC cable well it's not specifically article 330. so in 330 is where they would specifically require it and there's no other piece in the code that specifically requires red eyes or any short bushings to be used so with that being said you have to be careful here before I expound on that more if you're dealing with AC cable and you head over to I believe it's 320.40 you'll have to you'll have to double check that but three when you get over to 320.40 it specifically requires any short bushings which doesn't really make a lot of sense to me because AC and MC cable they both come in steel they both come in aluminum they're almost identical I don't know why it would be required on one and not on the other and like we joke about at these meetings that I go to we look forward to your public input in 2026 right anytime we all state something really obvious they'll say something like you know usually just to get you off the mic they'll say hey we look forward to your public input in 2026 because we all think that if it could be required for MC or AC it should be required for MC with that that being said you could get caught on 110.3b which is the catch-all code right everything must be installed according to its listing and labeling instructions so if that wire manufacturer has dictated that you must use it and in my opinion if they ship it with it that's a pretty good I mean that's kind of nudging in the right direction right hey I've shipped you these anti-short bushings maybe I should now legally they would have to have it in their listing and labeling instructions for it to be code but with that being said I prefer to use them but I don't always use them and let me explain what I mean if I'm out on a job and I'm doing a service call and I'm there I'm not leaving to go buy any short bushings I'm going to take the jacket crack it crack it open I'm going to take the I you know we use paper jute and Romex I guess it would be plastic jute that they use inside of MC and I take it and I wrap that around and i stuff it down in there and then I stick my connectors on and the reason I have no problem doing that is because those uh connectors for the MC are listed to not use those any short bushings I'm not saying that all of them are but they're designed to protect the wire once you lock those in depending on what style you're using do I prefer to use the the anti-short bushings I do do is it code no and is it a deal breaker for me the answer is no man I like the mindset that's really helpful I mean just the code is so complex and talking it through and gaining you know you when you read the code you gain information but when you have this conversation you gain understanding and that is absolutely phenomenal okay another question for you we've got a concrete floor I've got receptacles throughout I've got no water source here in the warehouse space however I have occupied this facility I can tell you that occasionally during a hard spring rain water will come underneath the back overhead door because the ground's uneven and there's a there's a a ceiling weather strip however it doesn't seal uniformly because of the unevenness of the floor so you get water in the warehouse area non-gfci receptacles indoors here is that code what's best practice so you're gonna head over to 210.8b other than dwelling units and as long as you're not caught in one of those areas you don't have to GFCI protect it I will say that you're on the 08 so the it's a lot less stringent in the 08 than it is in the 8 in the 11 then on to the 14 and 17 and now into the 20. yeah just uh the biggest takeaway from this is that if it's not in one of those areas specifically listed in 210.8 B depending on what code cycle you're on you're not going to be required to GFCI protect the general receptacles I will say this you need to watch out for through 10.8 D which is specific appliances and you know if you're wiring something very specific make sure that it's not caught there if you spend just a few minutes reading there in 210.8 go ahead and read.8 a it's going to cover your dwelling units go ahead and read dot b it's a very short read you can kind of you can grab a whole lot uh just write that small section as far as best practices go I use a lot of common sense for one if it's in the code I just go ahead and do it don't worry about it but I use a lot of common sense if I am going to have water flooding into this door if I am going to have people working with metal utensils around metal poles they are going to be grounded on that concrete floor or am I going to go ahead and put it in the odds are probably yes and this is why I do it for when I want the safest install I want the safest install that's physically possible for two people have no problem paying for parts as much as they have paying for labor but that's the song for another day long story short if you tell somebody about a part of you just group it into Parts they're probably not going to say something as much as they would if they thought you'd charge them more labor uh you know they'll pay 80 for a piece of tile but they want to pay you two dollars to install it right it's kind of the mind frame or they want to pay you 26 000 to wire a house and then pay 40 000 for the front door so it's just uh you know if people don't mind necessarily paying for material as long as they see the benefit but as far as GFCI protection I like to put it anywhere in those type of situations just because I know I'm that much safer uh and the same thing with afci technology now I would very be very careful putting it in a warehouse if they're going to be using saws and other things that you've normally see in a warehouse so I really appreciate that that's so good and that's a good point you know an extra 20 bucks circuit to put a GFCI and protect everything Downstream you're not typically going to get much customer resistance have you worked a bit about your history have you worked in a customer facing role as an electrical contractor oh absolutely so I've been licensed for 10 years have had you know the eight guys five Vans been been the big you know the highest rated contractor in our area so I've lived tools on I just recently have taken tools off so my whole mindset is and before that uh I was a a Mason Contractor I can lay anything blocker Stone and then when I finally got off drugs and alcohol I got into electrical it's like it was a Time Warp all that lost time that I got I got back and then now I've done nothing but electrical contractor you know since till just you know until just now wow so how long in the trades as a whole and how long is an EC so uh 10 years as an electrical contractor uh 10 10 to 12 years as an electrical contractor and then as the trades as a whole since I was really about five years old so I've been on a job site since I've been around the trades I know how to do you know some drywall how to do carpentry know how to do I know how to do you know just kind of well-rounded that's really useful skill because as an electrical contractor you do you know a little bit of this a little bit of that especially if you're running service and you encounter all kinds of problems you're nine and some new construction more controlled predictable environment and in fact I've got my eight-year-old on the job site here today so he's he's learning as well that's great now mostly he's got his ball and he's bouncing It Off the Wall over there himself absolutely yep okay any last words for us oh really if I could just take a minute to talk to you know to your viewers so I just want to let you guys know that you've got something special here with Joel and I want you guys to get behind him support him encourage him uh you know because as he continues to grow and win and gain more impact I believe that you will as well yeah I really appreciate that and a call to the viewers guys you've got a wealth of knowledge right here Perry puts himself out there his YouTube channel is right here in the description Top Line check him out because when you've got access to a guy like Perry you don't have to bust all your knuckles learning it yourself you can go direct to the man the myth the legend Gap grab that information and and that information and Perry makes a good point of this if you've watched his videos you can monetize that information so that your customer wins you win it's right it's safe and you're winning today and in the future so Perry I really appreciate your time today guys check him out sub to his channel in Perry look forward to talking to you next time hey take care brother so yeah thank you got what I need here I think I'm all set what I'm gonna do is I don't have any uh Uncharted tombstones to convert this fixture like we did the others this old two lamp T8 uh sorry T12 eight footer but I am going to energize the last fixture I've got taken apart and that's going to illuminate the rest of this storage area so I'm ready to de-energize this circuit which is live you can see the red there and Tim you ready shut it off boom all right just check everything here make sure there's not a pass-through circuit check both your black and your white as a best practice because if it's too uh if it's uh 240 volt in this case it'd be 208 you could have two Hots in the floor the LEDs are compatible with 100 through 277 volts so they would function just fine I think now that I've got this rewired off the main and we are ready to energize this last little bit of fixture here that we G energized up the old switch okay hit it Tim should play him okay all right all right anticlimactic everybody back to your positions nothing to see here that's it 20 amp commercial switch new face plate that face plate is it's just for Aesthetics that's the only reason I'm swapping it out you know someone pays an extra 55 cents I feel like they got a little bit extra and Martin Martine keeps saying I just want it to be nice just wanted to be I like it clean so Martin this is for you bro so Tim's asking a valid question here or making a valid observation see I've got more than six inches of conductor Inside the Box more than three extending from the box and I've got a nice clamp style device so I'm not just side wrapping that wire I'm actually clamping it under the terminal of this 20 amp commercial switch so I'm going to flatten it out real nice I'm going to eliminate a joint leave the jumper behind some guys just love the pigtails the jumpers love them love and love them you know what I'll like to eliminate joints I don't dislike pigtails and jumpers but I like to eliminate joints and so I want to duck in here with my number one square snug that down that's Rock Solid so there is no jumper on this guy the blue I don't know which is hot which is switch leg but that is actually irrelevant here I just need one on one side one on the other and then I'm going to think I'm going to interrupt so let me just back it up and see I think I'm going to interrupt this up top and that's where I'm going to then jump my MC cable from my switch leg to my fixture okay take it back it's not relevant I gotta detect which one it is and put a jumper in so let's just scope that out real quick okay Warehouse lights are on is it that one oh look at me it's that one good thing that plate isn't grounded okay Blue's the hot Blue's the hot back off okay this is what we're gonna do begin with the end in mind we're going to remove this little this switch leg here we're going to cap it that was to the warehouse fans which are no longer in service and I just happen to have enough history with the space to know that this is my hot if I've done the job right I'm going to trim that back a little bit and we're not required to have pigtails and jumpers here we've got this nice clamping mechanism there it is so that's a nice tight commercial connection not typical of your residential devices I'm going to pull screws out break the ears off because those will not fit underneath this raised cover so those are gone separate mounting style the new screws will go actually through those holes right there through the face plate and through those holes so these screws are out these screws are what we'll utilize but the face plate comes with those this raised cover so now it's time to get an MC cable out of here assuming that's a neutral and what we're going to use is our Tasman I started to verify that I'm not doing very well my electrician hoops today keep missing the point blank shots into my trash box that is actually one of the fun parts of being an electrician you're up on a ladder you're like 20 feet from your box so you got to throw away a little part and just take take shots see I played Hoops in high school and so it's just it's fun fun little personal competition I should have taken sewing in high school maybe I would have dropped fewer parts that would have been a plus anti-short bushing optional device comes recommended but not necessitated all right terminating a fixture a couple of steps here strip your ground ship your black and white and if you're doing some jobs with scale you can use some components that will provide shortcut but that's not what we're doing here so I'm just using the manual method then we've got a total of two conductors per socket I'm going to cut off the excess because I don't want to have to fight that getting it into the fixture and then this these strippers are oversized for this conductor but if you turn oh turn them at a slight angle and pull extra hard you'll get it stripped there it is I had to chew at that one a little bit because the conductors small 18 gauge give or take okay so in this case I actually need a hot and neutral in each Tombstone but I've got two yellows to one Tombstone and two Blues to the other so it's not a color to color okay one blue and one yellow and inside the fixture I'm not too worried about color coding it's when I'm pulling building wire and I'm going to be more concerned so my one blue one yellow is going to be a neutral so just to clarify what I've got here is one blue one yellow match up all the ends each tombstone has a neutral crank it down then give it the tug test make sure nothing pulls out and if these were shunted tombstones meaning that you had um the two terminals were common inside the tombstone then as soon as you flip the breaker and the switch on hey it would blow just like that so they've got the clips on one end they just tuck up in there you want to make sure none of the wire is pinched which ours is really controlled in this case because I cut it short but sometimes there's a lot to fight and stuff particularly if the old ballast is in there and then check and see which side is your AC in that's a dummy side it's unmarked and then this side actually says AC line neutral so that's the end that I want to put down here to this Tombstone and that my friends is that okay a couple Jiffy Clips we'll route that MC cable over there I'm going to use a set of existing holes yep just long enough okay so there was a comment from one of y'all that you really thought it was super unprofessional of me to be using and then Staples to secure MC cable what do you guys think drop your comments below all right two zip ties Tim we'll just zip tie that up right there let's strip it right there oh here comes the Roto and it's lightweight too you know it's what 10 ounces or something less than that probably somebody's gonna look it up it was 8.8 it's very lightweight I need to do a better job at beginning with the end of mine sometimes a little exploratory like let's try this let's do that let's see what happens here then what I'm going to do is I'm going to face my connector about 90 degrees the opposite direction of tight and once I feel like I'm just just there and it's as tight as I can get it by hand then I'm going to spring into action with a small tool and finish it off to where it's immovable Now by finger force all right let's get this box this EMT is probably an acceptable ground path and it's probably well terminated at all points but I'm going to go ahead and take the MC more than three inches extending from the box more than six overall that's strip that terminate it to the ground screw I think I still have to work for that but it's it's in there all right let's make Let's test that make sure that neutral is valid bring our what is our switch leg here this black to our switch okay so this is a Auto Meter which is nice in that it'll Auto Range AC DC voltage performs both you could use it on your small circuitry and appliances you could use it on the job site you know let's just even do this watch this what you can do if you really want to be hands off while the circuit is de-energized slip that probe in there to give it just enough to hold everything in place now your hands free on that and bring it in here on the other side or maybe your your short A Pair of Hands just like this neutral is short it won't come any further out of the box take that use a larger throw the old wire nut in the trash use a larger wire nut like this red and slip it in there and here goes okay 125.1 volt that's the nice thing about the Tasman among other things one is so compact two it's incredibly cost effective three it's a light non-contact voltage detector with illuminated display voltage AC and DC resistance it's got audio so you get some cues and tips if your hands are full and you're in a tight spot it is a fantastic little meter I'm going to recommend it to you check the description there is an Amazon link to this Tasman tester click it add it to the cart check out beautiful little birthday gift Father's Day whatever the case is they're going to think you spent way more than 11.99 on this meter or guarantee it now let's shut the power off and wrap this up okay stuffing a little bit it's getting full watching watching okay you don't push too hard there it is make sure this is not so long it's gonna short anything out and I've got a clear line of sight here one two three we're batting a thousand on very simple tasks break room is now illuminated as gather up our tools and move on to the next job we're out of here to the final soccer game of the season playoff game against their Arch Rivals we've tied them 1-1 twice but for the playoffs we will go into shootouts if required and that my friend Martine is set up for success we'll be back to button up the final details and as for you subscribe to Electric Pro Academy for real skills to make real money I'm out"

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"VideoID": "846",

"Title": "Going for a ride #sparky #electric #trades #shorts #electrical #fyp",

"URL": "https://www.youtube.com/watch?v=TPLw6qZhal0",

"Keyword": "Commercial electrical construction",

"Transcript": "when this woke up today he didn't realize he'd be going for a ride bro get it"

},

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"VideoID": "850",

"Title": "How To Take Your Electrical Contracting Business To The Next Level In 3 Moves - #BossTalkWithTery006",

"URL": "https://www.youtube.com/watch?v=SF1Kejpt0PY",

"Keyword": "Commercial electrical construction",

"Transcript": "in this episode i'm going to give you three ways to take your business to the next level if you would like to build scale or grow an electrical contracting or any other type of skill trade business to multiple six or even seven figures in annual revenue then you're going to want to pay close attention to these exact strategies that i use in my own business so let's get it hey folks terror electrician here owner of smartwatch solutions in atlanta georgia and founder of the trade boss academy welcome to episode 6 of the boss talk with terry podcast so you're probably asking what are these three ways to take your business to the next level okay well one is to change your business model second way to do it is to change your business market and the third is to change your business message now the beginning of 2020 i made a dramatic change in the way i do business and i changed all three this led me to having my best year ever in business up until that point so let's break this down a little bit the business model and you know electrical contractors basically have two primary business models that we that we operate under service or construction all right my pride mary business model starting out was electrical construction i worked for many you know electrical contractors prior to getting my my electrical license and started my own company and they were commercial construction uh commercial electrical uh contractors so they did none of them did any residential um very little service and was basically uh new construction electrical and uh electrical build-out for retail spaces restaurants um that type of thing so naturally when i started my own company that's what that's the the the business model that i you know that i adapted so at the beginning of 2020 i i did you know i switched everything up and i switched from the construction based model to the service based model and i focused on residential service and here's the kicker i added appliance repair to the list of services that i offer my clientele so yeah we're talking uh some dramatic changes here but what that did was give my business a quantum leap in profitability prior to that you know i was basically i was barely making ends meet to be honest with you um breaking even never making never seen a profit um but we stayed busy we stayed because we provided a level of service that kept us busy kept just getting getting uh referrals and repeat business the problem and i couldn't and i couldn't really see it at the time it was just enough to keep me going you know just enough to just enough to keep us in the game you know not enough to prosper not enough to grow not definitely not not no way to scale because i could not scale that business model you know with me being the primary uh implementer in in you know in the whole thing okay so that's why you know i had come to a conclusion uh late 2018 that i needed to make some drastic changes um and then um kind of spent 2019 educating myself on on how to really grow and build a real solid business a solid profitable business uh really kind of spend an entire year you know still kind of you know um just kind of breaking even and uh but at the beginning of 2020 you know all bets were off and uh we uh we turned it loose and we made it happen so the second way to take your business to the next level would be to change your business market okay so as as i said i i switched so now that i'm doing service and i'm focusing on residential service now my market is primary homeowners as opposed to the fix and flip investors and general contractors okay and and there's a there's a different mindset when you're dealing with primary homeowners as opposed to these to contractors and investors now one you're an asset the other you're you're a commodity all right so with primary homeowners i learned how to become a valued asset right with the contractors and the investors look this is what it is they're looking for the most amount of work for the cheapest price bottom line so their profits can swell okay so they can get so they can get the bigger profits right and i'm not mad at them because that's their business model little did i know i had a choice whether or not to participate in their business model today i don't participate in that business model because i know i have a choice and i have i have today i have a business models that suits me uh that allows me to build a business that serves me at the highest level so i can serve my customers at the highest level what does that really do well it gives me the income the energy and the motivation to provide the highest level of service that i possibly can to my clientele okay so i had to change the switch to business market the third way to take your business to the next level is change your business message now some may be saying well i really don't have a business message well you actually do have a business message either intentional or unintentional okay i operated for many years with an unintentional message that i was putting out there and that unintentional method well message was here's a really good electrician who will work dirt cheap that was that was a message that i was putting out to the marketplace and i was putting that message out there and i kept perpetuating that message because i kept playing in the same sandbox right i kept doing the same thing hoping for different results how many of you know that that is the textbook definition of insanity okay so today i have a very distinct and powerful message and it starts with what i do okay that message is home electrical repairs well the messages we specialize in home electrical repairs custom home lighting and smart home technology now i'm sure you can hear clearly who that message is for you can also hear who that message is not for right having home in all three of those areas that we specialize in tells the primary homeowner that this is this is the guy for you these are the people or that that that you're looking for to suit your needs it's also to tell the the general contractors you know the construction guys and the investors that this might not be the person for you okay so again you have to have a clear distinct message for your market it's called message to market match if you don't if your message to market matches off you will continue to get you will continue to attract the wrong prospects for your business okay and this is extremely important when it comes to lead generation so that's the three like i said this is this allowed me this allows me to build a business that serves me at the highest level so i can serve my customers at highest level and what's the underlying principle here but the underlying principle is when you learn to sell your value you no longer have to compete on price and congratulations you're no longer a commodity okay so now that leads me to a sun zoo quote sun tzu said strategies without tactics is the slowest road to victory the tactics without strategy is the noise before defeat and as you probably know sun tzu is the author of the famous book the art of war and what this quote says to me is you can have all the great plans and and laid out blueprints in the world but if you don't put the action to it you have nothing okay and by the same turn if you run out there doing a whole bunch of stuff just to be doing it not with no real plan no thought out game plan no no real blueprint to follow then you're soon gonna find yourself out of business or burn out frustrated and disgusted i found myself after 22 years in business nearly 22 years in business burn out frustrated and disgusted and i had to make some drastic changes if i was going to continue to be in business thankfully i found the right people uh to lead me in the right direction you know and uh i was willing to do what it what it took to uh you know to to to aim towards that direction and so i can move forward and ultimately make this quantum leap in my business um also uh it doesn't matter what type of business you have these three principles because i mean strategies these three strategies uh can work for you now you don't have to use them all you can use one you use two or you can use all three like i did but you know one or more of these can definitely make a change in your business depending on where you want your business to go okay so if you're in appliance repair and you're not seeing the revenue that you want to see then you you may want to change your business model if you let's say you're you're doing appliance repair and you primarily do warranty work but you might want to change a business model to where you're primarily doing cod and maybe doing a little warranty on the side or a little warranty you know with uh mike's need an appliance boop boot camp and his blueprint you know he says you eventually want to get to 80 cod 20 warranty work which is a very good mix the warranty work is that that little buffer that you know that keeps you just keeps you in the mix you know what i mean when some of the cod work is not coming through you got that warranty working there as a buffer and there are some advantages in the warranty work but also some disadvantages and warranty work because basically warranty companies treat you like a commodity okay to a warranty company the third-party warranty companies don't get it twisted you are a commodity and the people's homes that you that you go to those are not your customers your customer is the warranty company so those of you in appliance repair you know exactly what i'm talking about okay so let's say you're in the plumbing business and you're doing you know you you're out here you're hustling this new construction same thing with electrical same thing with hvac because we can kind of we can kind of fold those in together appliance repair is just a little bit of an anomaly uh when it comes to this stuff but we can fold the electrical plumbing and heating in there kind of in the same box because you got the construction in the service side and it's a little bit more cut and dry right so let's say you're primarily doing construction maybe you may be doing new construction and whether that's commercial or residential and you know you're doing all these all these construction projects but you know that a lot of times you got to wait you got to wait for your money yeah the checks are bigger but the magician the logistics of running these projects running these jobs and getting these things done could be a freaking nightmare you know what i mean you know you got to wait for other trades to do their thing you got to hope that when you come in and do your work and the next trade is not going to come in behind you and screw up your work i can't tell you how many times plumbers and heating and air guys have cut my wires not only that drywallers you know installers coming in and covering up boxes and you know and when they cut in the box a lot someone when they cut the boxes in right cut my wires with the with the uh with the rotor zips that they used to cut the sheetrock and all this kind of stuff you know what i mean i i just really don't have to deal with that much today you know i i do you know basements and stuff like that you know unfinished basements i do very little renovation a matter of fact i don't do any renovation at this point but i would like and i've just recently finished an un an unfinished basement job where uh you know did a complete wiring of the basement and uh designed and built uh a full-scale home theater you know and and my customer has was absolutely delighted with the outcome i had to deal with that primary homeowner the whole entire time i didn't have to deal with no no other subs you know when the heat and there guys came in on the rough end yeah we were in there together working together but we were right there and there was no we had no problems a small enough project to where everything was pretty straight shot straight forward and we didn't have no issues you know what i mean so didn't have to deal with no gc didn't have to deal with no investors didn't have to wait on no checks did not you know as soon as i got my part done boom the homeowner paid me right and the roughing done got paid came in trimmed out the you know the basic electrical got paid you know came in and built out the home theater once that was done got paid no problem and i'm talking about either that day or the next day not next week not after waiting on you know who knows who or you know or which or whatever it's just a it's just a different world you know what i mean and it just you know it it's just a better fit for for where i am in life this you know today okay so anyway that's all i got for you right now and if you like what you heard in this episode you're gonna love the next one i promise you that i promise you so that being said be sure to like and share this episode and also you want to hit the subscribe button and ring that notification bell so you don't miss out on any future episodes on any of the other good stuff i got in store for you all right so until the next one deuces"

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"VideoID": "852",

"Title": "Never turn commercial electrical jobs down. Find a way to make money! #electrician #apprentice",

"URL": "https://www.youtube.com/watch?v=OCY6LnJtqrQ",

"Keyword": "Commercial electrical construction",

"Transcript": "All right. Next job of the day. Second job. First job. We did the pre construction job walk this one we got to get way up there 30ft with the lift that we picked up from Home Depot was cheap. It was easy. We got an air conditioned circuit that's out and we've traced it. Panel. It's got power coming out. No power at the unit. It's a straight run with two junction boxes. We're going to open up those junction boxes. See where the burned wire is. Let's take a look. That's where we're going. And that's how we're getting there. What's up Rudy, are you ready to go up? Let's do it. Rudy's getting up on that bucket. I ain't going up, but I'm going to take the car around. We're going to park it over there. We're going to get up. We got the TRD Pro towing the boom lift from Home Depot. Half day rental, $300 charging, $2,100 to get into a junction box. Just got to wait for him. Got nothing to do. All right, so we got the problem fixed. The problem was in the sub panel itself. It was a disaster. We had about 6 or 7 breakers double tapped. They had taken out wires, put in wires, crossed wires everywhere. Rudy's up there finishing up that part of it. So what we did is we spliced and reran a couple of number ten wires to refeed some circuits separated them out in the panel. I will be calling the client back, telling him there's probably another $6,000 here to completely clean up that commercial panel, add another sub panel so we can get about at least six more breakers so that we can continue to clean up the double up tap breakers. Let's take a look. All these guys were going up in that same conduit, and we've got a ton of double taps right there. You can see one, two, three, four double taps just right there. Coming down this side of the panel I already see one, two. Three. 45678. This is a mess. That's why you do commercial for jobs like this. Hey, hope you got something out of this video. This all together will come out to be about a $10,000 project. I'll try to shoot some more videos, but I'll be back in Montana. But Rudy will be here to take care of it. We will see you on the next one."

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"VideoID": "854",

"Title": "A Day In The Life Of An Electrical Apprentice!",

"URL": "https://www.youtube.com/watch?v=W2UHLx3Hq80",

"Keyword": "Commercial electrical construction",

"Transcript": "welcome to my channel YouTube it's your boy Steven and in today's video we're going to do a day in the life of being an electrical Apprentice when I'm going share my entire day with you guys and let you guys know kind of what we do on a day-to-day basis I'm not really sure what the plan is for the day um but whatever I am doing I'm going to share with you guys and kind of let you guys know I'm excited to do something a little different uh if you guys do like this type of content let me know in the comment section below and hit that thumbs up button and the Subscribe I thank you guys for all of the support truly appreciate it um but yeah let's get into the video hope you guys enjoy let's go right now got to terminate all of these wires everything that we have at the bottom is going to have to be lined up here terminated into the correct section so that's really what my job is today uh it's going to be a slow one steady one but I make sure all this is done correctly so we ain't got no mishaps but uh that's the plan that's the goal and um yeah let's see how it go so as I got to the job site today they explained to me exactly what I was going to be doing I was really excited because I hadn't done this type of work before so it it's exciting to you know do something different and learn something different all of these wires that you see are vfds um so if you guys don't know vfds stand for variable frequency drive um it's like a motor controller so it controls the frequency and the voltage of everything um all of these wires we going to a specific disconnect so we got to make sure that all of the wires and the phases are numbered right and I organized right going to the right section so that's basically what I'm doing with all of this and I'm trying to get everything taken care of today before the end of work but uh it's very tedious and everything has to be nice and neat done in the correct detail on both ends so yeah uh right now I'm zip tying the wires um some are going on the right side and some are going on the left side uh so my job right now is just to make sure that everything is nice and neat and everything is able to go into the right section so so um with the zip ties I just you know made sure it was tight enough so they wouldn't fall or anything like that but yeah it's very time consuming you know just trying to make sure that everything is done right right now I'm cutting all of the zip ties just so you know everything could be nice and neat um I was able to put six wires you know three three at the back three at the front and uh I think it looks pretty nice it looks nice and neat to me um the people that I show everybody said it looks nice also so I'm doing the exact same thing on the left side the left side has a lot more wires so a little it was a little tougher trying to get everything to fit in nice and neat especially towards the bottom because some of the wires got a little Tangled but um I did the best that I could with it to try to make it look as neat and professional as I possibly could and like I said this was exciting exciting thing for me you know they let me do this on my own I was the only one in there and um yeah I was kind I was proud of myself you know start to finish on how I was able to get it taken care of right now I'm also cutting some of the zip ties on this one um I used my diagonal cutters on the last one but they had me use another smaller cutter um just so it won't it won't cut you or anything like that U right now um going to L real quick about to eat my food had some fish rice and some asparagus now it's time to get back to work and this is how it looks from right now I think it looks really really nice um wasn't we still hadn't terminated everything cuz now I have to lay all of the phases of the wires so that they can match the other side of the disconnects where the wires are going to so this is very time consuming we had to make sure all of the numbers were going to the correct phases the ground phase one phase 2 and phase three and we also had our communication wires also that um we had to label so this whole process was time consuming um but like I said I wanted to make sure it was done right you know um cuz I wanted to go well you know this is my first time like I said of me doing this by myself and I was confident I could do it I just you know took it step by step and you know just kind of tried to just do everything right we also had to heat shrink the labels on there also just so they won't fall off anything like that and it was my first time using the heat shrink that thing do get hot so it was already 4:30 wasn't able to terminate everything but I did get a lot done today so I was happy about that now it's time to clean up um I see a lot of stuff all talking about electrician is not cleaning up but where I work we clean up we take care of all of our stuff so uh it's very important for me to leave this place better than I found it so picking up all of the zip ties that I cut um putting all of this trash to the side and just trying to get it ready for tomorrow when I come back there and hopefully be able to terminate it I didn't see a broom but I finally found one and yeah that was it for the today I was able to do all of this by myself I was excited about it I was working on vfds for the first time so I was excited about that truly grateful for the opportunity um you know and I know I got a long way to go so that was it for the day um getting ready to clean this up head back to the shop head to the crib and um that's time to go be a family man and go to the gym so I'll see yall at the gym let's go [Music] he [Music] he [Music] he [Music] he [Music] a [Music] a"

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"VideoID": "855",

"Title": "Basic Electrical Maintenance for Commercial Facilities",

"URL": "https://www.youtube.com/watch?v=KTn2khCDqyw",

"Keyword": "Commercial electrical construction",

"Transcript": "electrical outlets should be replaced if they are sparking getting hot or no longer hold plugs securely outlets have screw terminals on the sides and in some cases the screw terminals have clamps a thin metal break off tab connects the upper and lower terminals to supply current to both outlets if desired break off the tab if you want to control the outlet separately like switches hot wires connect to gold or brass colored terminals and ground wires connect to green terminals outlets also have silver terminals for the neutral wires in 120 volt circuits outlets at the beginning or middle of a circuit are connected to two hot wires and two neutral wires in order to continue the circuit while outlets at the end of the circuit connect one hot wire and one neutral wire like a switch you can use short pieces of wire to pigtail an outlet to the circuit in order to maintain the circuit if the outlet goes bad to replace an electrical outlet 1 always wear appropriate PPE for the electrical equipment you will be working on to turn off the power and follow the appropriate lockout tagout procedure unscrew and remove the faceplate use a voltage tester or multimeter to make sure the power is off 3 unscrew the outlet from the electrical box and pull it out with the wires attached 4 compare the old outlet to the new outlet and match up the wire connections also look to see if the metal tabs need to be broken off 5 disconnect the wires from the old outlet 6 if needed trim the wires and use a wire stripper to expose about 1/2 inch of wire on wires that will connect to the outlet then use needle nose pliers to form a loop at the end 7 starting with a ground wire loop each wire clockwise around its terminal screw or insert it into the screw clamp and in the screw if the electrical box is metal join the circuit ground wire to two grounding pigtails connect one pigtail to the outlets ground screw and the other to the electrical boxes ground screw eight tuck the wires in behind the outlet and then align and screw the outlet to the box nine reinstall the cover plate and then turn the power back on you"

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"VideoID": "856",

"Title": "MEP Schedule - Electrical for Multi Family",

"URL": "https://www.youtube.com/watch?v=hHazKxl-8N8",

"Keyword": "Commercial electrical construction",

"Transcript": "foreign [Music] the installation of Building Systems namely mechanical electrical and plumbing systems or MEP is spread out through the construction of a building this video will cover the electrical installation of mid-size multi-family buildings that is the final installation and not temporary power that is utilized during construction [Music] electrical activities in multi-family buildings differ in part to those in the single family because in multi-family buildings power is usually brought from the electrical grid which is how electricity is transformed from producers of energy to the final consumer through a Transformer and then each unit's individual electrical panel sometimes depending on the number of the units and how many buildings are in the complex electrical power comes into the site still at Mid voltage and it is only transformed to a lower voltage close to the entrance or inside of the building but before each branch is off to feed each unit in case of multi-story buildings separate common panels usually included and serves common areas in outdoor lighting electrical panel may also be installed for multi-family buildings there is usually more electrical rough and work that needs to be done during site preparation than single-family homes after site preparation construction continues to happen without the need of electrical Crews to come in until framing is done and inside the apartments much of the Electoral activities are similar to those of single-family homes once framing is finished electrical Crews can start installing wires and electrical boxes as well as the main electrical panel this is performed before drywall is put in place once wiring boxes and electrical panels are finalized and inspections usually performed to assess if they are done correctly because once drywall is installed this type of visual inspection is not possible once assessment is finalized and crews are given the go-ahead to continue drywall can be installed it is important to note that during the drywall installation drywallers must transfer the location of the electrical boxes to the drywall so that they can be installed additionally in mid-rise apartment buildings additional electrical work needs to be done in corridors and common areas this includes Lighting in corridors and the preparation for electrical closets which are usually found on each floor and it is from where the vertical electrical runs are branched off to horizontal lines then Electrical Workers usually will only come after all paint is complete to fine lines of work by installing all electrical fixtures such as Outlets light switches and light fixtures however even if all is finalized inside of the apartment up to the main panel and common areas there is a need to finalize any electrical power required for the site which includes lighting for parking lots and Landscaping if building in the city this could be minimized as sites are smaller however buildings may have parking areas that will need to be lit and powered accordingly electrosite work is usually one of the last activities to take place because it requires most of the area around the building which could be previously used for material laid out only once all electrical site work is complete with a local Electrical Company is called to finalize the connection between power to the building and units this includes installing meter or meters and connecting it to the main line and providing permanent power to the building finally electrical installation is usually inspected at a final inspection to provide a certificate of occupancy in a new building the coordination between permanent power and final inspection should be reviewed depending on the requirements of each jurisdiction extra tension is needed when planning apartment complexes in phases to see how the timing of each phase and weather finalized phases are occupied to understand the implication of these to the scheduling of electoral activities [Music] foreign"

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"VideoID": "858",

"Title": "Grounding and Bonding an Electrical Panel",

"URL": "https://www.youtube.com/watch?v=vAD3r\_nF6L4",

"Keyword": "Commercial electrical construction",

"Transcript": "hey guys sean lentz here from appalachian diy and today i'm going to show you guys how to ground and bond an electrical panel so what we're going to be doing today here first is we're going to be running our ground wire and to start that we're going to head outside the first thing that we're going to be doing outside is we're going to be driving ground stakes down into the ground we have our electrical panel directly behind this meter here so what we're going to be doing is dropping straight down and driving our ground rod right in there how we are going to be doing that with a 5 8 ground rod we have this little attachment here all that is is it slips over the end and allows us to use a demolition hammer to hammer these down straight into the ground it's a lot easier than using a sledge and trying to hold these things upright what we're using is 5 8 grounding rod this is copper plated you can also get them galvanized it doesn't really matter a grounding rod is a grounding rod real quick with these grounding rods the placement of them we have a garage here it's slab on grade so i can see right to the edge of my slab i know there's not going to be a concrete foot or anything under here but if you're running these things down near a house make sure you're stepped off at least a foot from your outside wall that way you don't run this thing down into your footer and it stops a couple feet out of the ground if you're crunched for space you can also run these at an angle but what we're going to do is we're going to run this one straight down right underneath this meter here here is our demo hammer and it literally just fits right over top of that put it in hammer mode and let it sink in so what we ended up doing with that first stake we encountered two rocks one around four feet um we ended up just using a sledge to sludge through that one got almost all the way down about a foot left we use the sludge again to break through that and then just drove it the rest of the way with the demo hammer uh so we have a really hard rocky clay soil around here so it's super hard to drive some of this stuff but way better than sludging all the way down through so now what we're going to do is we're going to measure off of our first grounding stake six feet needs to be a minimum of six feet it can be a little longer you can go six and a half seven feet and we're gonna put our second rod in back in our garage what we're going to do now is we are going to get our wire where we want it to run through our wall app now i'm going to choose to do it a little bit lower to the ground instead of having a pass through up top and then having to run a tube down or conduit down to the bottom on the outside just makes it a little bit nicer everything's nice and close to the ground so we have a hole saw here and we're just going to make a hole right through our sheathing to the outside we're going to kind of keep it nice and tucked to this stud member that way we can attach our ground wire to that and keep it nice and secure so what we have here is we just have an electrical junction box and that's just gonna go right here to pass through to our wall we also have a 90. we're just going to stick that in here like this right and we can run our wire right up through here it's going to get covered up to dirt to about here what we can do when we run our wire through here is we can put some silicone in here that way we're not getting any water or any insects having a clear path into our garage so what we have here is a grounding rod clamp so what this is going to do is it's going to clamp onto our grounding rod making a secure connection between our grounding rod and also our grounding wire so we're going to clamp on to this grounding rod run to our first one with our wire and then into the garage so we have our grounding clamp here we're gonna make our connection right here we're gonna put it down maybe about half an inch we're just gonna snug this onto the grounding rod so these teeth are biting into our grounding rod making this a nice secure connection right here what we're going to do is take our other grounding rod and we're going to put this one on right now that way we can just go six feet down this way and it'll be all ready for us so what we're going to do now is we're going to put a 90 degree bend in this wire like so run that wire right up there and we're gonna stick this out probably about an inch to three quarters of an inch and then we're gonna snug this one down so now that's really snug and with this um sticking up here like this i'm going to take a hammer and bend that right over now we have a super secure connection we are grounded to the rod with the clamp and our grounding wire is grounded here to the clamp itself so this is a nice secure connection this thing isn't going anywhere so now all we can do is we can just go ahead and take our other clamp slide it down to our first grounding rod so now we can just unwind this wire into our little trench that we have here up along our garage we will slide our clamp that we already have in place right down here to our first connection here okay so we want to do the same thing we want to bend up to a 90 to get on the connection here so we're going to bend this make sure this is down in our trench good bend that up at a 90 degree bend there okay and it's exactly the same as the other one snug this clamp down and then we can snug our wire down and we're going to do the same thing we're going to tap this down so it's a lot more flush now we can go ahead and take our conduit pieces we are going to be coming through our bell end here first so we'll stick our elbow on first okay that's about where we want it then we'll go ahead and fit our box on here all right so i'm liking that about right there once we have that set now we can pass it through here because this is probably the toughest bend to get this bent up back around and back through our wall all right now we can pass this wire in through our wall okay so here is our connection we have our ground wire coming up from our ground stake into our 90 and up into the garage so this will get covered up with dirt the reason we drive these down so far is because we don't want to hit them with a string trimmer or anything and the reason we put this 90 on here is if we do get grass in here and we hit this it's not going to damage our grounding wire everything is covered up by either dirt or some type of conduit to protect it as it goes into the garage the only thing i haven't really found is how to securely attach these to the garage itself um so if you guys have a good option whether it be to just drive a nail through here or some type of connection on the inside i'd love to hear that in the comments below but this is the way we are looking right now we can go ahead and cover this back up with earth or ground and then we can move to the inside now what we can do is we can take our ground wire run it up along here behind our conduit and into our box so we have our ground wire up here to the bottom of our box what we're going to utilize is square d's quick grips and just put a little v into our ground wire and then run it right up here to our neutral bus bar there you have it we have our grounding wire tied into our neutral bus bar so the last thing that we're going to do is we're going to take this bonding screw and bond our electrical panel what this screw does is it bonds the neutral bus bar where it goes right up here in the top corner takes it through the neutral bus bar and into our panel so those now are connected so say you have a grounding bar over here on your panel right that grounding bar will be grounded to the panel itself if it is separate we don't have that on this one but many of them do there is no way for that ground to make a connection to the neutral bus bar because it's elevated off the panel with this plastic backing so we need to bond those together and that's what this screw does it goes through our neutral bus bar ground or bonds the neutral bus bar to the panel itself which if you had a ground bar over here on your side it would make that connection then without this screw there is no way for current to get from the neutral bus bar to your ground bar over here on the side we have taken our ground wire and taking it right into our bus bar but we are still going to bond our neutral bus bar to our panel itself i hope you guys enjoyed this video if you did make sure you hit that like button and head over to appalachian diy for more videos thanks again guys and i hope to see you next time [Music] you"

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"VideoID": "859",

"Title": "How to build a temporary electrical service",

"URL": "https://www.youtube.com/watch?v=gJ75hYJYLb8",

"Keyword": "Commercial electrical construction",

"Transcript": "hi guys in uh this video I wanted to take a few minutes to talk about some of the requirements for setting up a temporary power pole I've looked online at several different videos and I had never seen anything that fit into the particular area where I live codes vary from one location to the other so I thought that I would do this video to show you a little bit about some of the requirements for a temporary power service within this area within Kentucky uh of course even within Kentucky the codes very similar this is for a new construction as you may be able to see behind me depending on the glare of the Sun and we have got our Transformer pole and line set they did this just a couple of weeks ago and then I started assembling the temporary service pole off site now some of the requirements for the this area is that the pole must be a minimum of a four by four and it must be a minimum of 14 foot long or larger now you can use a six by six or uh larger I suppose if you wanted to but it has to be mounted a minimum of 10 feet and a maximum of 25 feet away from the Transformer Pole now this one is kind of in the middle I'm probably about probably about 18 15 to 18 feet approximately and that is how this pole is currently set up you can also see that I've got some additional bracing here the post must be guided and you know it's always good to have a little bit of extra support on these to make sure that it does not collapse uh starting from the weather head up top on this particular pole and this is why you want to assemble these sometimes offside and then set them up it must extend above where the utility is going to connect onto it you can also see here the eye bolt that runs through the post through the 4x4 post that is to give the utility company something to tie the cable on to help support the electric lines so you've got to make sure that you get that in as well now coming down from the weather head I'm using Triplex cable I also have the conduit fastened and at a few different points there are minimum requirements for how far you can be from the weather head as well as the meter base and you want to make sure that you secure it accurately and in here you can see our Triplex here we have the two Hots as well as our neutral coming in through the meter base as well as through here coming in through here we are then coming into our main disconnect panel our main disconnect is right here and there must be for these panels within within this area they must be a minimum of 60 amps but we're a little above this we've actually gone with the 100 amp panel on that that way we have plenty of room uh to play with and which really for a temporary service we don't really need a lot other than just being able to run some power tools coming in here our main is tied here we also have our neutral tide here and something that you've got to remember that a lot of people Overlook is you must have the neutral bonded within this area it must be bonded and you can see that we are bonded here with this strap we also have our Ground Bar over here our bare ground coming down it is fastened to the pole also and then going out to the ground rods there must be a minimum of two ground rods for this area the first ground rod cannot be less than two foot away from the post and the other one must be at least six foot away from that and they must be driven all the way in I know some areas may allow you on attempt service to Only Go part of the way but in this area you have to have that ground rot all the way in as you can see that we have here and a little trick is to soak the ground heavily before trying to drive those it makes it a little bit easier putting them in that is just some of the requirements for getting this grounded now once you have all of that done you can then tie in your receptacle and if you're familiar with electrical work uh it should be something fairly simple for you it must be a GFI which we have here it must be a weather resistant cover must be a good protective cover to keep it from getting wet and then it's just our standard wiring coming out with our power our main lead to the breaker 20 amp breaker then our ground of course is going to the Ground Bar as you can see there and then of course our neutral going up to our neutral bar fairly straightforward you might want to talk to your inspector prior to setting this up also talk to your utility any specific requirements that they're going to have for you and that way to make it a little easier on yourself instead of having to go back and redo something because you did do it the way that you needed to the first time you give them a call they're usually pretty friendly pretty helpful anyways guys hope you like the video I'd appreciate it if you would give it a thumbs up also be sure to subscribe drop me comments with questions down below thanks for watching check out the rest of the videos in the series and we'll see you next time"

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"VideoID": "863",

"Title": "Electrical Wire Color Coding Used By Electricians",

"URL": "https://www.youtube.com/watch?v=LhZcWykPWQc",

"Keyword": "Commercial electrical construction",

"Transcript": "what's going on my friends this is dustin stelzer   with electrician you and today \nwe're going to talk about wire [Laughter] colors [Music]   okay what do all of the wire colors mean why do \nwe have red and purple yellow and green and white   and gray all these different colors of wires \nwell if you look we have the same color of tape   so we can mark different wires different \ncolors to identify them as these colors   but these colors are very specific so what is it \nwhy did why are there different colors [Music] first off if all of the conductors were black   how would you know which ones which there \nare certain conductors that have different   potentials between each other so we need to be \nable to identify a conductor that has power on   it versus a conductor that doesn't have power \non it but there are very specific points within   a circuit that we also need to identify and it \nbasically just means this wire is a certain thing   this wire has voltage on it relative to another \nwire or relative to ground but it's telling us   a little bit of information for the most part \nmost of the colors are what we call ungrounded   conductors or hot conductors all the hots um have \na bun a whole plethora of different colors and it   depends if you're in a single phase environment if \nyou're in three-phase environment as to what those   colors will be but pretty standard across the \nboard we're gonna start out with the green wire   the green is what's known as ground overseas you \nknow europe things like that they call it earth   but it's the same thing it's what's tied to earth \nto the ground the reason we call it a ground   is because we physically bring a wire from a \ngrounded conductor or a neutral down to the ground   and tie that into ground we basically bring the \ncenter point of an electrical system down to   the ground and touch the ground with it so that \nthe center point of the entire electrical system   all the way through the electrical \nsystem and every pole along the way   everywhere is referencing the same point the \nsame potential essentially so there's not big   large fluctuations between different parts of the \nelectrical system so we have a common reference   point for ground and ground is always green and \nground is also earth so that's not going to change   anytime you see a ground conductor or if you see \na yellow conductor with ground green stripes on   it that's another way that they identify ground \nnext we're going to talk about white white is what   we call neutral it's also what in the code book \nis called the grounded conductor now there's a   difference between a grounding conductor and a \ngrounded conductor gets confusing when you're   first trying to start to understand code just \nremember that a hot is ungrounded it's not   touching ground at all it is a hot wire we don't \nwant it touching the ground so ungrounded is hot   and grounded is neutral hot neutral ungrounded \ngrounded they both end in ed the weird one   is the one that doesn't have any power on it \nand that's the green that's the one that's   the ground wire so that's how i always remembered \nhot neutral are ungrounded and grounded and then   ground is the grounding conductor so anyways we're \ntalking about the white conductor or the neutral   when you're out in the field nobody's gonna call \nit the grounded conductor we're not lawyers we   don't wear suits every day we're not making up \ncode we are electricians and we call it a neutral   so the neutral conductor is white and that's going \nto be across the entire system whether you're   in single phase or in a three-phase environment \nthat's the wire that is the center point between   uh two different phases three different phases \nor if you're in a single phase environment   basically you have two hots or you have three \nhots two ungrounded or three ungrounded conductors   but the center point of all of those where the \ntransformer is tapped to be able to cut all of   your voltages from 240 volts down to 120 volts \nyou have to have the center point that you can   tap off of so to identify that center point in \nthe system we call it a neutral and we tape it   white so that we know that every other conductor \nin that system is going to have a certain voltage   to this one reference point so the grounded \nconductor and grounding conductor or the   neutral and the ground should be at the same \npotential when you have a meter and you're you're   on your voltage setting and you go between a \nwhite and a green there should not be any voltage   between them it should your meter should read zero \nvolts if it doesn't and it reads like 40 volts   there's a problem but we need to know what the \ngreen and the white mean because the green and   the white shouldn't have voltage on them and then \nwhen you look at a white compared to a red a white   compared to a blue a white compared to a black \nwe know that those colors mean there should be a   certain voltage between those conductors so i know \nthat between a black and that white there should   be probably 120 volts 110 115 somewhere in that \nballpark that's what i would expect a red and a   white same thing a blue and a white same thing \nbecause in a three-phase system you're you're   gonna have voltages that are between one hot \nand neutral you're gonna have voltages that are   between one hot and ground and you're gonna have \nvoltages that are between one hot and another hot   so the the other reason why we would have blue \nor black or red is that each one of these hots   needs to be identified as to which phase it is \nwhich incoming leg of the system it is so we know   if we've got the black conductor that all the way \nup to the pole and going back to the utility that   black conductor is our a phase and then we've got \na red conductor we know that that one goes back   and that's the i guess the middle phase or the \nnot really the middle phase there's three phases   they're all equidistant but you get what i'm \nsaying the black the red and the blue represent   which incoming wire has potential in relative to \nanother hot wire so the black the red and the blue   are usually three phase colors in single phase \nlike you have in a house you're just gonna have   black and red so that's how you know when you \nopen up a panel whether or not you have single   phase or three phase single phase is just gonna be \na black and a red and then you're obviously gonna   have your neutral and your ground your white \nand green you're gonna have those everywhere   but then if you go to three phase you're gonna \nhave black red and blue as your three hots and   you're gonna have your white and your \ngreen for your neutral and your ground   the next color we're gonna talk about is orange \nso orange is something that you're probably   rarely going to come across but you will come \nacross sometimes in residential sometimes in   commercial but it's older three-phase \nsystems in a three-phase environment   typically you're gonna have three hots and those \nthree hots all have the same voltage between   all of them and usually they're gonna all have \nvolt the same voltage to ground or neutral from   hot to ground or neutral the orange tells you \nthat's not the case it's almost like a warning   or danger um for that color choice because it \nmeans one of those hots actually has 208 volts   to ground so if you were to take your multimeter \nand go like a phase to b phase you're going to hit   240 volts if you go b phase to c phase 240 volts \nc phase 2 a phase you're going to get 240 volts   nothing weird there the orange doesn't affect \nthat it's only once you start testing to ground   from each one of these hots so from phase a \nto ground you're gonna have 120 volts just   like you should like you would think c phase to \nground you're gonna have 120 volts but that b   phase that's marked orange is going to have 208 to \nground that's really important to know because if   you were to start putting a whole bunch of wires \ninto a panel and just landing them all like you   normally would just one breaker at a time fill \nin every single spot top to bottom everywhere   that you have b phase in that panel you're going \nto have 208 to ground so say that one of those   wires that you've got hooked up to one breaker \nthat is pushing 208 through it you hook a vacuum   cleaner that's rated at 120 volts and you run 208 \nthrough it you're going to fry that vacuum cleaner   tvs anything like that that's not rated for 208 \nvolts you're going to fry so this happens often   i mean it's it's just one of those things \nthat people don't really know what that   orange means until you learn the hard way or \nuntil somebody you know teaches you um so watch   out for the orange thing orange kind of just means \ndanger uh something's different here need to know   something's crazy here now i will say that there \nare some higher voltage systems some like 480   and up systems that utilize orange in their \ncolor depending on where you're at in the country   you could come across a three-phase system that's \n480 volts and the colors are brown yellow purple   or brown orange yellow now that orange and a \nhigher volt system that's a 480 volt system   doesn't mean the same thing when it's in a \n480 volt system it's just one of the three   hot colors so there's no difference in voltage \nbetween any of those things that's why some cities   don't use that color nomenclature some cities \nprefer doing brown yellow purple i think most do   but there's just some weirdo cities out \nthere that like to do brown orange yellow   brown yellow and purple usually mean that you are \nworking with a voltage system that's higher than   a typical three-phase voltage system so it's not \nnecessarily medium voltage or high voltage a lot   of electricians call the black red blue they call \nthat low voltage and then they call high voltage   brown yellow and purple it just means that instead \nof you having 240 volts from hot to hot like you   would on the black red blue on the brown yellow \nand purple you're going to have 480 volts between   each one of your hots and you're also going to \nhave 277 volts between each one of the hots and   neutral or each one of the hots and ground \nso it's a little bit higher voltage system   most of your equipment is going to be 600 volt \nrated for this environment whereas before you   were at 250 volt rated so it's just a different \nclass of equipment different class of gear   higher voltage going through everything so you \nneed to know that because it's a little bit   more dangerous it's a lot more \ndangerous to be working on this stuff   so that was oh and another one we have the gray \nconductor so anytime you see a gray conductor   or something taped gray usually that's to let \nyou know that in a 480 volt system that's the   neutral conductor or the grounded conductor so \ngray for 480 volt system is the same as white   for a 240 volt system white and gray just mean \nneutral but it's just for two different systems   now there are some places that you're going \nto see different colors than this or you're   going to see some of these same colors mixed \ninto things and they don't mean the same thing   for instance if you have ballasts if you're like \nworking in a fluorescent fixture or an led fixture   you're going to open up and see one side of \nthat ballast has a black and a white conductor   the other side of the ballast usually \nhas two reds two blues and two yellows or   a red blue yellow depending on what kind of \nballast it is but red blue and yellow are ballast   leads and it's just basically \ntelling you what are my two   supply or line side conductors and which \nis my load coming back into the ballast   and there's wiring diagrams that actually show \nyou what color is what part of the circuit so   in that situation these colors don't mean the \nsame things it's just a way for them to identify   the outgoing and incoming another thing that \nyou're probably going to find in lighting   control systems that are colored conductors are \ndimming wires so there's some ballasts out there   that you can remotely dim a load from a different \nlocation and there's two extra conductors that go   up into light fixtures and they will have inside \nthe fixture somewhere for these wires to land   and a lot of times these are purple and gray \nconductors so a lot of higher end light fixtures   will come with a set of dimming leads already \nin the fixture or you'll come across these   t5s are a good example a lot of t5 \nballasts t8 ballasts that have these little   inputs so that you can put dimming wires in \nor if you're ever up in like a whole row of   fixtures in a shopping center or something like \nthat and you see these purple and gray conductors   that are usually a little bit smaller you \nusually like the size of ballast leads   you just know that this is remote dimming so \nsomewhere there's a lighting control system   that is um sending a dimming signal rather than a \nregular dimmer would just you know start to change   um the nature of the circuit so that it starts \nto dim uh these actually have constant power   to the fixtures but they send a remote signal to \nstart to dim the power so it just works a little   bit differently so that's pretty much it for the \ncolors they're really just telling you this wire   has this potential in comparison to this wire \nor this is this place in the system and these   are the other things in the system it's actually \ntelling you information so that you don't miswire   something and accidentally blow something up or \nget somebody hurt you need to be you know even   if you're wiring like speakers there's always a \nblack and a red conductor so that you know what   your positive and your negative is because you \nneed to know in relation to one or the other   um and you know in that situation a speaker might \nnot actually work if you flip those wires in a   house or a commercial building or an industrial \nenvironment you mix up your wires you could blow   something up create a fire kill somebody so \nit's really really important to be able to   identify conductors and know which conductors \nthat you're working with so just to review   the green is the ground the white \nand the gray are the neutral   black red and blue mean three phase black and red \nmeans single phase but they're usually 240 volts   or less orange means that you've got one conductor \nthat's 240 volts to ground where all the other   hot conductors are going to be 120 to \nground so it's kind of like orange is   like a hazard color it's a warning and \nthen you've got your high voltage stuff   already said the neutral is gray but you \nhave either brown orange yellow boy that's   how i remember that in weird places but the \nmajority of people are doing brown yellow purple   and that's bip byp that's how i remember the the \norder of them and what phase order that they go in   but that's it so thank you guys so much for \nsitting through that was probably really   boring i love you crazy people make sure that you \nhit subscribe like the videos if you like this   stuff really helps me out i would appreciate it um \nthanks for all the support if you're interested in   merch go to my website links in the description \nbelow if you're looking for some practice tests   and you actually want to try to take a practice \ntest not just flip through a book and answer   questions but but test yourself and take a \npractice test check out another link in the   description below go to electricianu.com \nand you can actually take practice tests   for your residential wiremen's license your \njourneyman's license and your master license   love you crazy people and i'll see \nyou in the next one [Music] you"

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"VideoID": "865",

"Title": "Can&#39;t grow an electrical business if you don&#39;t level up in business - I&#39;ll show you how",

"URL": "https://www.youtube.com/watch?v=\_taCSuUymmc",

"Keyword": "Commercial electrical construction",

"Transcript": "hey welcome 360 electricians if this is the first time clicking on my short you've come to my channel i am jeff the 360 electrician that's my house i'm building over here in montana i am living in montana right now i'm building my house in montana the 360 electrician channel is in montana but my brick and mortar 360 electric is in california i'm a master electrician here and i have an unlimited license and i'm a c10 contractor journeyman in california what i do is help you level up in the game i don't care if you're an electrician or you're an electrical contractor if you want to level up go check out the website www.the360electrician.com if you're already a subscriber thank you you know i love you i have a passion to help you if you're new click that subscribe and we'll see you on the next one"

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"VideoID": "867",

"Title": "Contractor Tech Part 2 - Having the right software to run your electrical and construction business",

"URL": "https://www.youtube.com/watch?v=yJxe8lv5X-k",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] big shout out to upstrive for sponsoring this video again i can't tell you how passionate i am about you getting into the trade well upstrive will help you do that their trained professionals will coach you and help you to get your license in the state that you're in check out the link below and let the upstrive experts hook you up with the coach to train you and teach you so you can pass your contractors test the first time they've got materials and all the resources you're going to need check out upstrive in the description below and let's get into the video in this episode we are gonna talk about contractor tech part two part one which i'm gonna put the card right up top we talked about what's in my contractor's bag and that was just showing you some of the tech that i use day to day and just to run my operation well this one is part two because i want to talk about software now we need software to run a business so if you're about to start your own business you are in your business and haven't really gotten too far and you just need some ideas on how to level up for 2021 let's talk about essential software that i use and i think that you can benefit from so let's just say you're going to start your business and you have no idea what technology you might need to run it i want you guys to see what we use over here so i've just got my top three software picks that i wanted to give you and share with you let's take a look at the screen obviously the first one we're gonna pick is your financial software financial software is super important when you're trying to run a business you need somewhere where you can keep track of all your billing all your customers all your data your expenses and all the good stuff you're gonna need for taxes so quickbooks is probably the industry standard when it comes to finances and that's something that you're going to need to make sure you do your taxes payroll and all your accounting correctly how you're going to find out how much money you're making how you're going to find out how much money you spend on certain categories if you go online and take a look at quickbooks and hit the plans and pricing you're going to see five subscriptions that they offer now if you're just starting out you could just play around with the self-employed one it's the cheapest one at 750 a month they might even have a 30-day free trial however if you're gonna grow your business or you're gonna get into advanced payroll if you're gonna get into credit card processing i suggest you probably start out with the plus if you're a costco card member make sure you call for that subscription because you will get a discount so once you're in here i really don't care which one you're going to pick i am not here to do an in-depth review for quickbooks but i am here to tell you that you're going to need something like quickbooks freshbooks or another accounting software so that you can level up in 2021 tip number one get financial software before you start your business whoa whoa whoa whoa time out if you're getting something out of this context stop right now and hit that subscribe button we need your support to keep bringing you videos like this so if you're getting something out of the video hit that like button subscribe let's get back into the video all right tip number two super important as you start your business as you grow your business or if you're in business for a little while and you need something that's going to help you run it my pick for service software is service fusion service fusion is one of the most robust online field service management software there is we've tried a lot of them we've demoed at least six different ones service fusion happens to have the most features for you it's got the best integration with quickbooks online quickbooks desktop it's got a gps system included where you just buy the module from them they charge you a small monthly fee fee and now you can track your fleet see where your vans are for scheduling it also has a basic marketing and email system the thing i love most about it is once you get all your customers into the system it will automatically send them text messages of when you're gonna arrive and when your schedule is they can even accept your estimates and jobs online again it's packed with a bunch of features check them out another good software to look at it's not as robust but super clean as far as the interface goes and that's house call pro links are all at the bottom all right last but not least one of my favorites email marketing lists you have to level up from the beginning you have to get your data into one place for marketing the best way to send out marketing cheap easy and efficient for a busy lifestyle mailchimp check them out we've been using mailchimp for several years now and the thing that i love most about them is that if you have up to 2 000 contacts and that's a lot of contacts it's absolutely free to use sign up at mailchimp.com put your email in there first and then start an email campaign and check them out and play with it you cannot lose my third tip email marketing through mailchimp there are other ones out there like constant contact and many others go on youtube and check out the reviews of the best email of software out there for you okay so let's recap tip number one financial software we use quickbooks tip number two service software it's a little expensive but it runs your day-to-day operation we love service fusion and tip number three keep the marketing going by keeping in touch with your customers with email campaigns through mailchimp.com i hope that helped don't forget the link to our sponsor ups drive is down below give them a big thumbs up let them know that the 360 electrician sent you and let's level up for 2021. we'll see you on the next one [Music] you"

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"VideoID": "870",

"Title": "SHORTS - Commercial Electrical Materials Apprentices Should Know",

"URL": "https://www.youtube.com/watch?v=nbxcWH\_Grr8",

"Keyword": "Commercial electrical construction",

"Transcript": "what's going on my friend this is dustin \nstelzer with electrician you and today   we're going to talk about a whole bunch \nof different commercial materials that you   should know if you're getting into \ncommercial electrical work [Music] number one is the 1900 box so this is essentially \na multi-use box what you do is you put a device   in it so you could have a receptacle or you could \nhave a switch inside of here and you bring all of   your wires into these knockouts around the sides \nnext up is the industrial cover it actually fits   on an 1800 box next up is the mud ring they \ncome in different different depths they come   in different uh numbers of devices you would \nput this on the front and it allows you to put   sheetrock over it next up is the bracket box and \nwhat it does is allows you to actually stand it   up on something and then screw it in place so if \nthis is a stud the box screws to it the next box   that you want to know is the gang-able box some \npeople call this a cut-in box or a pop-in box   but typically you're going to be cutting \nsheetrock and sticking this inside of a hole   into a wall and then running wires into \nit and then having a device inside of here   there's screws here and you can actually remove \nuh these plates and you can stack multiple of   them together to make like a three or a four or a \nfive or a seven or a ten gang box if you want to   next up are mc connectors there are \nsingle mc connectors that a single   piece of mc cable goes into you would literally \njust knock one of these holes out and snap this   thing in place it locks in and then you run your \nwire into it these are double barrel connectors   because you can put two wires in them all right \nso next on our list is mc cable essentially it's   gonna be the same thing as romex on the inside \nbut most of the time you're gonna be using mc   because it's a lot more rigid it's harder \nto break there's all different kinds of mc   just like there's a whole bunch of different kinds \nof romex but so you can understand what mc is   here it is all right next up are conduit fittings \nthis is a connector whereas this is a coupling   you notice there's no threading on the couplings \nthey just it's it's a pipe in pipe out whereas a   connector there's actually threading on one side \nthat goes into a box so your conduit stops at that   box couplings connectors another good thing to \nknow is the blank so the 1900 blank is something   that goes on 1900 bucks there's not a device going \nin it and you're just making up joints and pushing   them in the back you're going to use a cover next \nup is the 12 by 12 junction box you're going to   use a lot of these you're going to see boxes \nthat look this size where it's four inches deep   by 12 inches wide by 12 inches down these are just \npretty much the same thing as a 1900 box just a   lot bigger another thing that you're going to come \nacross in commercial a lot are relays essentially   just know that relays are multi-pole switches \nbut it's an electronic remotely controlled switch   so just know a relay is an electromagnetic switch \nthat you can switch multiple things with all right   so i can't talk about the relay unless i talk \nabout the contactor as well so a contactor is   the exact same thing as a relay it just handles \nmore amperage so it's used in a little bit more   beefy situations what it does is it allows you \nto take one action that affects a whole bunch of   different circuits at the same time all right \nnext up we've got spring nuts and cone nuts   so spring nuts go inside of unistrut or kendorf \nor strip channel or whatever you call this stuff   but they twist in there and it allows you to \nhave a surface to bolt onto cone nuts are a   good alternative i love cone nuts that's really \nall i use but the same thing they push inside   and they spin and just lock in place and \nthey're nice because you can slide them   next up is strut or kendorf or can truss or strut \nrack or channel whatever there's so many different   names for what this is you're usually using \nit because it's so rigid to mount things to   bolt it into concrete pour fresh concrete and bury \none of these and then when the concrete dries you   get something really sturdy and rigid sometimes \nwe even just use them to strap pipe we'll build a   service on a wall and we'll stick this behind our \nrisers so we have something to attach our riser to   next up i'm going to talk about \ntwo different kinds of conduit   emt electrical metallic tubing and the \nother one is rigid metal conduit this   stuff lasts a really really long time \nand it's damn near impossible to break   you'll always be able to tell ridgid when it's \nbrand new on a shelf because it comes threaded   but emt you're never going to thread you're \nalways going to use couplings and connectors   and stuff to put on the ends of these things \nall right the last one i want to cover is flex   or flexible metal conduit most people just call \nthis flex though all right my friends so that's it you"

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"VideoID": "871",

"Title": "The Most Important 15 Commercial Terms And Conditions In Contracts [Construction]",

"URL": "https://www.youtube.com/watch?v=uCgu56pnksQ",

"Keyword": "Commercial electrical construction",

"Transcript": "hello and welcome to costa engineering professional i am ahmad adil and in this video i'll talk about the most important 15 commercial terms in contracts starting right now [Music] in contracts or agreements there will be many clauses terms and conditions that you need to understand and pay attention to and starting with the term number one which is the contract type there are many types of contracts that can be used especially in contracting but the most commonly used type of contracts is fixed price contracts and by the way the lump sum contract and the remeasured contract both of them are fixed price contracts but in the lump sum contract the contract value is fixed however in the remeasured contract the rate of the items in the contract is fixed and the quantity is to be remeasured after doing the works to come up with the final contract value so you need to make sure what type of contract are you using for this project or work package and there are five lectures talking about contract types in our procurement management course and you can find the link in the description down below the second term to pay attention to is contract price because despite the contract is lump sum or remeasured there will be a contract price not only in the lump sum contracts but in their measured contracts too you will need some tentative quantities in the beginning to establish the contract price so how much is the value of the works or how much is the contract price is a very important part of the commercial terms the third term we want to talk about is insurances what are the insurances required for this project usually the works involves manpower which means that in most of the cases you will need workmanship compensation insurance or if the scope of work includes design then you will need professional indemnity insurance or for main contracts you will need car insurance and car stands for contractor all risk so you have to make sure that the contract is covering all the insurances required for the project the fourth commercial term that we want to cover is the terms of payment which means how and when the money is going to be paid as per the contract and the terms of payment are agreed as part of contract finalization and they are of equal importance as the contract price itself and some examples of terms of payment can be the advance payment percentage the advanced payment security progress payments material onsite payment submission time certification time cdc or pdc and i have explained all of that in one video here on the channel this video is called terms of payment explained for construction industry the fifth term is advanced payment security advance payment is paid upon signing the contract before starting the works so what is the guarantee of this amount that is paid against nothing no works has been done yet and still the money is paid so you have to keep the advance payment form of security in the contract it can be a security check or bank guarantee but very important money is paid against something either work done or form of security so we have to check this term in the contract the term number six is recovery of advance payment in case there is advanced payment in the contract how this advanced payment is going to be recovered usually the same percentage of the advanced payment is deducted from the total work done in each payment certificate and i have explained that in details in one video here on the channel this video is called how to prepare payment application for a complete project and that is an example with numbers so it is very useful the term number seven is the performance security known also as the performance bond and this is a guarantee of performance so having a performance bond as per the contract will guarantee that the performing party will adhere to his obligations which means that you will have a guarantee that the subcontractor that you are hiring will perform his duties and will execute all the required works in accordance with the terms and conditions agreed in the contract and if he didn't do that you have a guarantee with you and you can punish him if he didn't perform the performance bond can be in the form of a security check or a bank guarantee and i talked about it in more details here on the channel in the payment terms explained video the term number eight is duration and the contract duration is the time required to complete and hand over the works so when you award some works you cannot wait forever until these works are completed so we must agree the duration required for the works and keep it in the contract and in case the subcontractor didn't finish the works on time it means he's in breach of his contract obligations and we'll see how to deal with that later on in this video the duration that you put in the contract can just be the total duration of the project and you can mention that the detailed program of work should be submitted after signing the contract within a specific period of time or you can have the detailed program as a part of the contract even before signing the turn number nine is the commencement date and this is the date of starting or commencing the works because you have agreed the duration in the contract but when it starts from this duration starts from what from signing the contract or from a specific date or maybe upon receiving a notice to commence doesn't matter from what exactly but what matters is the point of time where the project starts and from that point of time the duration starts counting so the duration of the project is measured from the commencement date to monitor the project and the progress and the delays and these things so commencement date is a very important term in the contract the term number 10 is progress payments so we have talked about the advanced payment that will be paid in the beginning of the project but the payments that will be made during the execution depending on the progress of work these are the progress payments and in the contract you should agree the time of payment weekly bi-weekly monthly or milestones and how long is the certification time which means from the date the payment application is submitted what is the time you need to certify the payment and issue the payment certificate the term number 11 is the retention and the retention is an amount that is deducted from the monthly payments to guarantee the completed or the executed works and usually it is a 10 of the value of the total work done and this takes us to the term number 12 which is release of retention the 10 retained amount is usually released partially half of it will be released upon completion of works and the second half will be released after 12 months which is the defects liability period so during this period the contractor is responsible to repair any defects that appear in the works that he has executed the term number 13 is tax and if there are any applicable tax in your country you need to make it very clear in the contract whether the contract price includes or excludes these tax so that no confusion happens in the future while executing the contract the term number 14 is the delay penalty and this is a penalty that will be applied in case of delay or not adherence to the project duration that we have talked about previously and an example of how it is applied can be let's assume the duration is 10 months and the delay penalty is 2.5 percent per week which means in case of 4 weeks delay 10 will be deducted from the contract value 4 into 2.5 percent that's 10 and usually there is a cap of the delay penalty in most cases ten percent which means if the delay is five weeks instead of four weeks in our example the deduction will still be ten percent because the delay penalty is kept at ten percent the term number fifteen is dispute resolution mechanism and it is very important to mention in the contract how disputes will be resolved no one wishes for disputes to happen but still you don't know the future so the mechanism to resolve disputes should be agreed upon in the contract and it will be either court of justice or one of the alternative dispute resolution mechanisms that i'll talk about in detail here on the channel in the future this video here is the one that i talked about where i explain everything you need to know about payment terms and conditions and thank you so much for watching and if you have enjoyed this video make sure to like the video and subscribe to the channel to not miss any videos in the future and i always appreciate your valuable support and see you in the next video"

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"VideoID": "873",

"Title": "Day in the life of an electrical apprentice",

"URL": "https://www.youtube.com/watch?v=67I387enHcU",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] ugh [Music] oops so ah [Music] all right guys community 525 on my way to work going to a packinghouse and a cold storage combination i'm not really sure took me about 30 minutes to get there apparently 38 degrees it's cold over here in central valley ugh [Music] um good so [Music] what do you think the panels they're right there see the pipe right there where it goes down mm-hmm i'm gonna cut you one and just go straight across and then turn right there like how we said i don't know if we're gonna go under how many feet is it yeah [ \_\_ ] long so just copy this one yeah how many circuits it's just the feeders the feeders i don't know what i think if we go right here all the way straight from because that one goes to a gutter this one yeah it goes to a gutter right there where are we gonna put the gutter at the end or like in the middle of this or where uh this is the one that we're gonna have more problems you know what i mean yeah because of this area grant grant just got here and as we can go here there's no room nah because this thing's looks like it's pretty much right against that pipe already probably yeah that one goes to the panel he said and then um we're thinking maybe go over this pipe but we wouldn't be able to get a kick right here because we would have to kick it like right here and this thing isn't even gonna even get right there though there's no boom do you think it here be easier just to go up all the way out and then go all the way that way so we got a straight and then down again [Music] what did we miss that skylight you're what you're yeah it's up there wow yeah it's pretty packed down huh all right so how we're gonna run this pipe is we're gonna come out of this panel right here we're gonna use one of these spare ones it's uh 250 amp so we're gonna come up and then we're gonna go over those one injures those three one inch pipes out the wall and then still above and then go up and then 90 at the bottom right there [Music] and then 90 oh we're to 45 we're gonna do 45 to get to the more to the right of those two pipes right here so we can get onto that rooftop and then we'll put a can over there to go down that way [Music] all right so change of plans we're not gonna run it from this side we're gonna run it from all the way on the other side so let's go for a walk right there [Music] [Music] you could just use spring nuts or tech screws just mount the can onto the dirt blocks right here and use that as a 90 to go this way because you're going to be right here 90 down yeah it's not that far from the from where we're gonna 90. i'm gonna have to pull this by hand so i don't want it i don't want it from there to there be hella long yeah yeah just so you don't get that that the extra 90. uh foreign [Applause] so [Music] so everybody wants to be an electrician until they got a rune pipe on a roof all day [Laughter] for three days [Music] yes sir [Music] so hmm [Music] do [Music] so [Music] [ \_\_ ] [Music] all right guys well this is how much we got done this is day two starter stopped recording a little early yesterday because it was a little much down there but this is what we got done on day two pretty much just putting pipe and we're gonna put a um pool box down there where that box is at yeah it's not fun up here i mean it's not too hot but the reflection of the sheet metal and everything it just makes it uh pretty hot um let me know if you guys like the video leave a comment leave video suggestions um yeah thanks for the support"

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"VideoID": "875",

"Title": "How To Make Up Electrical Junction Boxes (Commercial)",

"URL": "https://www.youtube.com/watch?v=cnpcxsOMm4Q",

"Keyword": "Commercial electrical construction",

"Transcript": "all right as an extra bonus video business junction box for 1116 deep so anyways I was asking about how to makeup junction boxes I'm not gonna go through and show the whole thing being done but this one's basically already done into stuff him in the box but I do want to explain it a little bit maybe if that's what you're asking if you needed help or whatever but basically this is the home run pipe goes back to the panel so there are four sets of wires in here and the person who did this did a good job and labeled them so if not then it would be a real big nightmare but basically this is what you do and you pull the wires in and you label them before you pull them in so basically when you get ready to hook them with the fish paper however you're putting them through the pipe you label them and then you label them on both ends so that way you know which wire goes to which and then same thing with the wires coming into the box so this is self explanatory or super DZ so you got 3432 those are the circuit numbers and I'm 38 and 36 I just focus in other words those are the circuit numbers and then basically you just imagine number circuit 34 goes to 13 34 over there just follow them the other sorry I'm early videoing this but basically 34 to 34 and then 34 to 34 neutrals together awesome together and you just repeat that so 32 32 34 and 34 36 to 36 38 to 38 and basically it's just tying the closures together all the grounds go together each scenario might be different but and this is just straight tie through so that's the home run pipe and then just these are at the home run wires going to their destinations so some of these go to the kitchens and stuff like plugs and stuff like that dedicated tying them together grounds together and then the circuit number 38 so your hots together 38 to 38 hot and then the neutral is to do 238 but unless you're sharing in neutral the other box that did over on the other side of this beam was sharing in neutral but they obviously do a good job and tape them together so basically it would be like this like you'd be sharing are neutral so it'd be the two haunts would be taped together with the neutral so you'd know you'd be sure in the neutral stuff like that so yeah let me try to explain that a little bit so like the home run would the home run neutral the white one would be taped together with these and then basically you're a 38 and 36 or whatever number they are you just take those two whites with this one weights there would be three wires instead of just normal to like this right here I'm trying to grab the wrong wire but anyways instead of just two it'd be three so that might be an occurrence but anyways I'm priming around a video space for today's video but I wanted a video this first time up here and then I will go ahead and video the rest of the day and stuff I worked on so anyways and then I'll try to do the motivation video but anyway I was just gonna stuff these in the box real quick and I probably won't show that just so I don't have to clip that together but here is the here's the lid right here panels 620 volts circuits 32 34 36 38 and don't judge me because that was very slanted it's like so anyways hope you guys enjoyed the video thanks for watching I'm pretty sure that guy bus have a great weekend like the via subscribe and notification bell if you want to be notified every time I upload or livestream thanks guys see you later have a great weekend"

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"VideoID": "876",

"Title": "7 Commercial Electrical Tools Worth Considering",

"URL": "https://www.youtube.com/watch?v=-qmSx2aPxdw",

"Keyword": "Commercial electrical construction",

"Transcript": "just learned about this it's flexible it's breathable it's padded it's comfortable [Music] hi this is joel waltzman ceo and master electrician of jefferson electric this video seven tools that every industrial electrician needs these are basic tools but if you've been doing the resi world for a while you may not have these tool number one mc cable stripper dude check it out it's so easy the end of the wire was bent that gives a good clean cut with a gentle edge if you if you've been used to using something a little bit more uh tenuous to try to get in there and snip that off you're probably leaving that sharp edge compressed up against your wire tool number two a wire caddy this thing is worth its weight in pure gold take a look at that peels right off oh yes uh-huh the alternative to that is a bundle sitting on the floor coming off with loop-de-loops and twists of all kinds getting tangled wrapped around framing it's messy it's ugly and it's impractical without the wire caddy [Music] all right so i've got one electrician that's got beautiful handwriting it's like cursive script it's practically calligraphy doesn't do me any good i need bold clear fonts i need the next guy to know what the last guy wrote i need total clarity right here number three one of these on every service van bar none the durability the longevity i've never had one of these brady label makers fail jam quit break across all the team members all the electricians all the service fans never ever ever this is the cost to value to reliability ratio winner winner chicken dinner rechargeable battery drop protection brady label maker highly recommended in fact architects and engineers will often call out on plan sets brady label or equivalent for identification purposes number four right here you know this is real small it's almost inconsequential sometimes it gets in the way but i tell you what the transition from a residential to an industrial electrician the difference is a production mentality a manufacturing mentality an efficiency mentality the aggregation of marginal gains one percent every day little strokes felt great oaks this little baby right here it brings me home with energy from my wife see that's it that's all i'm talking about right there as opposed to set it down pick it up as opposed to where did i set that thing where is it where did i put it it's right here right you can you could carry two or three tools at a time that would get a little too cumbersome i tend to be more mobile and active i'm gonna knock something loose but pick the tool of choice what are you using right now what's the job at hand tool number five a drill tap set take a close look each one of these points is a common thread size for electricians and construction workers it's got a drill tip with a tapping thread i did not realize how inefficient i was being until i purchased a set like this i've grown to understand that i need to use low torque to preserve and extend their life overall generally speaking these are expensive drill bits but the time that i find by utilizing this the advantage that's gained i'm pulling these babies out every second or third job for installation and repair work if you're one of our subscribers you're following the story of our channel you understand that we've moved into a new warehouse and in the back shop behind the warehouse just today i utilized these bits to overcome a challenge that was presented on the job in the installation of a ground bar and a sub panel to service power to the shop saving me time money i'd be running around getting other parts if i didn't have these on hand [Music] alright number six is not this check this out this is a self-tapping screw on a number two phillips head i just lost it there's no or very little magnetic holding strength 5 16 magnetic nut setter it's extended length can get in tighter spots easier particularly inside a recessed portion or area i'm not going to drop my self-tapper off the end excellent grab total control hvac guys are good about having these but you know electricians are not i'm gonna guess that one out of two electricians possibly two out of three does not own one of these and it's just so beautiful it always does the job i rarely rarely lose one of those screws [Music] number seven the ball cap bump cap i just recently learned about this guys where has it been all my life do you know how many minor cuts i've had to the skull and head it's crazy i'm crawling around in attics i'm in crawl spaces i turn the corner and bam a ding on my forehead on the side of the hvac i'm bumping into plumbing plumbing hangers right skin in the scalp here it is so i love wearing a ball cap one branding front and center for the customer right they're looking at your eyes they're looking at your brand beautiful two keeps dust out of the eyes even safety glasses have a little bit of a gap there ball cap wonderful three i'm not getting all this dust in my hair so i get in my truck i take my ball cap off and it's not raining dust everywhere from working on the older homes plaster and lath but what perfects the suite is the bump cap just learned about this it's flexible it's breathable it's padded it's comfortable i've yet to find any flaw in the design of this bump cap absolutely wonderful preserves your head from all kinds of minor bumps and bruises this is not a hard hat and it's not going to be osha compliant for a situation that requires a hard hat but this bump cap it's one of my newest best friends there's no question i've had it for a month or less i love it so you can still wear your favorite hats and then just insert the bump cap that's all it is six bucks on amazon guys absolutely wonderful why does this matter worker satisfaction work quality quality of life see the processes like this better tools better mentality better mentality better outcomes better outcomes higher revenues higher revenues happy wife happy wife happy life by the tools subscribe to electric pro academy for real skills to make real money and check our next video for more of that"

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"VideoID": "877",

"Title": "One Line Diagram | Deep Dive | Electrical Blueprints",

"URL": "https://www.youtube.com/watch?v=BURDbbISi-8",

"Keyword": "Commercial electrical construction",

"Transcript": "hey what's up guys this is john speer with warhammer hope you guys are having a great day today we are going to be going over what a one line is what it does what you're going to use it for and how to read it so this is a very s simple one line diagram that we have gotten so in this particular case in this building which has four floors um in this one it is saying that the existing which would be the e thousand amp vertical bus which is a bus way that goes all the way up um all floors that has a thousand amps and then on each one of those floors there's a circuit breaker that goes like you know 100 200 300 amp type of disconnects that you basically plug onto the actual bus itself so it's same from that 200 amp disconnect that's going to be located on the bus that is going to panel 4l which is a 125 amp if you can see right here and it is carrying 480 volts and 277 so is three phase four wire system that is y connected um from here is saying that all these particular wire runs are already done and completed it is conduit and conductors are to remain so you know we don't have to do anything to that it's just a diagram basically showing us the route that it's taking currently from point a to point b so it basically goes from this panel which is a 480 it's a 75 kva transformer which is existing comes out of that feeds at 400 amp main circuit breaker which is a panel that has uh in this particular case a 400 amp main breaker versus an mlo which i don't see one in here but an mlo mike lima ohio is going to be a main lug only which is in uh in its essence just a lug system that doesn't have a disconnect it's relying on the disconnect from um said panel prior to it to feed it so this one is a 400 amp main circuit breaker meaning it has a main breaker to shut off the buses that are located in this panel section it's a two section panel so um if that were to guess it would be a line load system so line coming into the main breaker and then uh lugs coming out to feed section two so it is saying that all of this is to remain nothing to do here and then for the one that we're looking at is the intercept and extend this 100 amp feeder and relocated to the cr location which i'll show you guys in a second but it currently has four number ones and one number eight and an inch and a half conduit so if you want to take a look at it it's going to do so here's cr1 on the demo plans it's currently located over here this is a secure area so basically everything in this area would have to be internal but you would basically want to intercept it right here in this location and extend it over here now let's take a look at the demo plan so you can kind of see what i'm talking about so as you can see right here on e146 as a reference point which would be the stairs it is like on the third stair so if we were to go back down to the legend passed it here we go it's actually located right here currently so we'd be extending from here to here with an inch and a half conduit with four number ones and number eight if i'm not mistaken but we can double check and a number eight ground so that is basically in a nutshell the one line diagram um do you guys have any questions i would be happy to answer any of them um once again my name is john speer with warhammer electric and i hope this little video helped you understand what a one-line diagram is and what it does and what it's for um just has a another little fun fact if you wanted to see any panels located right here they should be all located on your panel schedules right here which will give you an even more detailed um solution here you know so you know like this one saying the peter size 200 it's a copper bus it's surface mounted and it's a nema one you know which is all important information to know but you know if you want more detailed information on this versus the one line the one line will give you a little bit of information basically what feeds what your panel schedules i'll tell you what's beating the other parts of the branch circuitry which is good to know and then you can usually just try to find something that simulates just like a very rudimentary rectangle in a room and that's typically going to be your um electrical room like this as a perfect and what these little cubes are trying to show you is that this is the space required around this panel that is needed which is going to be three feet in front of it so nothing can be three feet in front of this area so just as a if you ever see one of these little dotted lines in front of a panel that's what that is um like i said my name is john spear warhammer electric i hope you guys like this little video please like and subscribe below um you know very happy that you guys took the time out and watch this video but means a lot to me and i really appreciate it and uh you can follow that up with a nice like and subscribe i would really dig that as well you know so um we do have an amazon store so feel free to check that out there's a bunch of cool little things even some star wars chopsticks pretty badass they even light up and everything um hope you guys have a good day thank you"

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"VideoID": "879",

"Title": "ESFI Commercial Electrical Safety During Disasters",

"URL": "https://www.youtube.com/watch?v=Gf4OsJLxKL4",

"Keyword": "Commercial electrical construction",

"Transcript": "while we can't prevent natural disasters from impacting our communities we can ensure our businesses are electrically safe before and after a storm in the event of a natural disaster it's important for businesses to create emergency shutdown and startup procedures for the electrical systems equipment and HVAC before a storm arrives be sure to charge all phones and electronic communication systems once fully charged disconnect all power to affected areas and to minimize flood damage raise equipment above expected flood levels after the storm blows through and you begin to evaluate the aftermath it's important to avoid flooded areas if any electrical equipment has been exposed to water be sure to review ESF eyes guide to water damaged electrical equipment to verify what can be reconditioned and what must be replaced if you need to use a portable generator make sure to use a listed and approved transfer switch and GFCI protection businesses should also consider upgrading to alternative power sources such as micro grids energy storage systems or other decentralized generations this allows the power source to break off from the main grid and operate on its own using local energy when necessary in a storm energy efficient smart grids are a great way to upgrade electricity supply networks by using digital communications technology smart grids detect and react to changes in usage and one of the most basic preventive measures is relocating main energy sources and major equipment to higher floors of a building to help prevent water damage for more safety information visit es mi org slash disaster safety"

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"VideoID": "880",

"Title": "Check Out TSTC&#39;s Electrical Construction Program!",

"URL": "https://www.youtube.com/watch?v=spF5bMqaQBc",

"Keyword": "Commercial electrical construction",

"Transcript": "it's no secret that electricity is needed to keep every building running electricians are the technicians responsible for getting that electricity everywhere it is needed in TSTC electrical construction program located at our Waco campus you learn to design install and maintain both residential and Commercial wiring systems through extensive Hands-On training you will also be familiarized with blueprints building codes and the latest and oosha regulations graduates go on to work for top companies such as Walker engineering and Amber electric Texas is ranked number two in the nation for hiring electricians and the average salary is over $50,000 plus according to the Bureau of Labor Statistics Texas shows a projected growth of over 14% in the years ahead higher than the national average so if you're looking for a career with a bright future electrical construction may be right for you"

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"VideoID": "884",

"Title": "Electrical Quotation 2023 l Quotation For House Wiring l By Entire Electricals #housewiring2023",

"URL": "https://www.youtube.com/watch?v=ZWL8bkKOdl0",

"Keyword": "Commercial electrical construction",

"Transcript": "foreign [Applause] [Music] foreign [Music] foreign [Music] [Music] foreign [Music] foreign [Music]"

},

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"VideoID": "885",

"Title": "Esticom Guided Tour - How to Estimate a Commercial Electrical Project",

"URL": "https://www.youtube.com/watch?v=9c2IFb8CZik",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] hello there I'm Chris Lee and head estimator here desta come in this guided tour I'll demonstrate our integrated takeoff and estimating capabilities on a commercial electrical project to begin log ended at SC calm calm and you'll land on your company dashboard that displays your current projects in the various stages of the estimating process next click add new project enter the project name project description the status project due date and time the customers name and location and the estimator assigned to the project next let's upload a set of drawings for the project click the plans tab add plans and you can upload from side site Dropbox Google Drive onedrive or directly from your computer this can take anywhere from a few seconds to a few minutes depending on the size of the file once the file is uploaded the plans are broken out into individual sheets that can be deleted renamed are organized into folders the remaining sheets will be available for markup on the takeoff screen let's click the take-off tab and begin our quantity takeoff first use your mouse to move the drawing around in your mouse wheel to zoom in and out of the drawing next use the plan navigation to rotate between the different sheets within the set of plans by name before we can accurately measure we'll need to set a plan scale you can do this using one of the predefined architectural or civil scales are by measuring between two known points like a three-foot doorway in our example the drawings have a 1/8 inch depicted scale on both sheets and applied the scale for all plans so now that the scale is set we are ready to add our first takeoff click add new takeoff catalog and let's browse to the electrical database and choose our pre-built 20-amp duplex receptacle this assembly includes the receptacle conduit strap couplings and wire required for commercial environment keep in mind we have a full commercial and residential electrical database of parts and assemblies you can add two and two just the parts and assemblies you prefer at any point in time back to our takeoff now select the 20 amp duplex receptacle and choose the take-off type which in this case is count adjust the symbol size and color as preferred and click Add to plan this puts you into takeoff mode and you can begin counting the receptacles on the drawing every click increments the count by one to exit takeoff mode click the takeoff name from the list now you're in edit mode and can move or delete takeoffs as desired now that we've counted the desired receptacles let's use a linear takeoff to extend our overhead branch circuits from the electrical panel to the outlets click add new takeoff and browse to the power of lighting branch assemblies and let's use a 3/4 inch EMT overhead branch with nine number 12s to begin click select and choose linear from the drop down and adjust our color preference to begin the measurement we'll click next to the panel and make a run by dragging the mouse and single left click to turn [Music] to our first outlet and then we'll double click to terminate the run now let's grab an assembly with a lower wire count now let's add some Foursquare boxes above each of the receptacles this time we'll choose count let's change the symbol to a square adjust our size and pick a color that's appropriate let's jump to our lighting plan and begin those takeoffs to expedite the demo I've added a few items we'll need to get started let's begin with the 4-foot LED luminaires with power whip specifically the H type as depicted on the plans now let's run our overhead branch circuit in boxes close enough to tie this group of lights together lastly let's add our ceiling mount occupancy sensors now we'll want to edit the description on LEDs to match the lighting schedule for quoting purposes this flows to the estimate and eventually our bomb that will send off to distribution for pricing now let's click the estimating tab to view our takeoff quantities and make adjustments we can adjust any of the blue fields as required at the bottom you'll see the summary data for the group or phase and this gets extended out in the summary section where you adjust your labor cost overhead and profit in taxes you can also break your job up into phases for pricing and project management purposes let's break them into power devices in one and lighting in the other in addition to organizing our estimate we can also create a bill of material in Excel format to send off to our parts house for pricing you'll notice the assemblies are stripped down to the raw materials and consolidated into individual line items our last step is to create a customer facing quote you can do this by clicking show bid which displays an itemized quote broken up by the group our phases you set up on the estimating screen if you prefer to display less details you can choose to display pricing by groups or phase instead now click export bid and this downloads a PDF copy you can email to the customer for approval this concludes our guided tour if you would like a personalized demo or to sign up for a free trial please visit SD calm calm today"

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"VideoID": "888",

"Title": "HOW to calculate a large service!! parallel runs #shorts #fyp #electrical",

"URL": "https://www.youtube.com/watch?v=BfYHDkMAINM",

"Keyword": "Commercial electrical construction",

"Transcript": "anyone ever wonder how to calculate a service for 1200 amps in this case these are 500 so we got four or five hundredths and if you look here 500 is good for 310 amps each so we got 75 degrees C and you see here 310 amps right there that's 500 so you multiply that by four and what does that get you over 1200 amps and that's great so we'll go to 240 we can see here 1200 amps is a standard size and we're over that then we also see when we have over current it's rated over 800 amps you got to be greater then the rating of the over current device which we are so in this case if we had for example 1100 amps of wire we couldn't go to the next standard size in this case we have over 1200 amps so we are good to go in every situation here but more importantly than anything make sure that the install matches the engineer set of plans thanks for watching except for more"

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"VideoID": "889",

"Title": "Top Notch Electrical &amp; Maintenance Residential Commercial Electric Services Repairs Installation",

"URL": "https://www.youtube.com/watch?v=k\_38ZDX7tew",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] thank you [Music] [Music] thank you [Music]"

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{

"VideoID": "892",

"Title": "The mySchneider Contractor Program for Electrical Contractors | Schneider Electric",

"URL": "https://www.youtube.com/watch?v=k3gH8KHix0c",

"Keyword": "Commercial electrical construction",

"Transcript": "Hi, my name is Natalie Block, and I oversee\nthe Contractor Channel at Schneider Electric. All over the world, electrical contractors\nare adapting to the continuous transformation and changes that are taking place in the industry. With these changes, contractors are evolving\ninto more than just an installer of electrical and mechanical equipment. By diversifying their skillset, expanding\ntheir scope of work, and focusing on operational spend for their customers, electrical contractors have taken on an invaluable\nrole throughout the project lifecycle from the design and engineering stage all the way\nthrough operations and maintenance. As the world and industry transforms, so does\nSchneider Electric. With that, I invite you to join us in a Partnership\nof the Future, as we empower you with the new mySchneider Contractor Program launching this year. Focusing on efficiency and innovation, the\nmySchneider Contractor Program provides our partners with the tools and resources to drive\nprofitable business growth. By joining the program, you will gain exclusive\naccess to benefits that range from increasing your day-to-day productivity to certifications\nthat will help you establish yourself as a trusted expert with your customers. Several of these benefits that promote efficiency\nand innovation can be accessed in the personalized digital experience. Here you will find end-to-end self-service\ntools, software, educational resources, and personalized training paths that are made\navailable to you 24/7. Through the program, you’ll gain preferential\naccess to Schneider’s latest innovation and offers and the opportunity to join Schneider\nElectric Exchange. A platform that brings industry experts and\npeers together into a new digital ecosystem for collaborative interactions to drive innovation. And last but not least, by joining the mySchneider\nContractor Program you will gain eligibility to become a Schneider Electric EcoXpert. EcoXpert partners deliver expert competencies\nfor EcoStruxure solutions and services all over the world. Through various certifications and specializations,\nyou have the opportunity to differentiate yourself from the competition as a certified\nexpert that your customers can rely on. At Schneider Electric, we are proud to be\nleading the digital transformation of energy management and industrial automation for our\ncontractor partners. As we continue the transformation to an all-electric,\nall-digital world, the mySchneider Contractor Program is here to support business growth\nand success with our valued partners. Visit SE.com or reach out to your local Schneider\nElectric representative to learn more."

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"VideoID": "894",

"Title": "Electrical construction in Boston",

"URL": "https://www.youtube.com/watch?v=zYz4YHb3\_Wk",

"Keyword": "Commercial electrical construction",

"Transcript": "welcome to the 103 advantage com thank you for clicking on this industry webcast we appreciate the time today and hope it will be time well-spent this website and its content is designed to show everyone that IBEW Local 103 and its partners in labor the electrical contractors are just that partners today's program will help demonstrate that point over the next half hour or so we'll talk about the labor-management relationship the new contract between IBEW Local 103 and the Boston chapter of nikka the National Electrical Contractors Association what's happening in new work and the market share battle and whatever else seems to come up during this conversation joining me today Mike Monaghan business manager of IBEW Local 103 and Glen kingsbury the chapter manager of Boston nikka gentlemen welcome thanks thanks don't you know it's kind of strange you know anyone that knows anything about the electrical construction industry to see labor and management sitting together under one roof with you know everything going okay I mean cooperation is part of your business you agree with that mine absolutely i mean the lay persons opinion of labor management because they have different titles is that we don't get along and that may be the case for a good portion of organized labor but specifically in the building trades definitely local 103 and nika it is truly a partnership we're in this together and we have a common goal and that is to increase our market share and get to work and so we go at it differently than maybe other labor and management arrangements in organized labor glen you agree with those points or anything else you'd like to add on the labor-management cooperation angle no Don I agree wholeheartedly obviously the key to our success a key for any employer every contractor is to the workforce is the number one key to their success and having a good quality workforce productive trained safe is the key to their success and that's where the relationship between the ibew nikka our job Mike's job and my job is to make sure that we do the best to provide our contractors and our workers the tools they can do to be successful in the workplace now you mentioned it a little bit in your answer and that that is training you know I think the number is somewhere around 3 million dollars annually into your training fund your state of the art facility just across the parking lot from the hall maybe just go ahead and talk about just the dedication to training and how important that is in both a labor-management relationship because you guys jointly fund it and also how that makes sense in the electrical industry putting the best labor force out on the job that you can well I think certainly the ib w nikka joint apprenticeship training concept is one that works as a model and union and onion I think the non-union is looked at our model as well and in copied it a little bit other trades have looked at that model but it's it's a it's a great model we fund it jointly we have about just over a 3 million dollar annual budget which we fund and no grants no government training no public funding and we use that facility to train the workforce of the future and we can change on a dime as we see different different industries change whether it be the renewable world or product and whether it be a fiber switch from a cat5 to a five a scenario we can change we meet we meet monthly and we talk curriculum and we can change that quick so we're ahead of the curve for the future in training and have the best trained both electrician in telecommunications technician Glenda do the contractors play a role in that change in kind of talking about with the industry demands and what it needs in terms of being able to shift curricula or anything along those lines to make sure that the best trained workers get out there absolutely our program is it's called the joint apprenticeship and training committee and that's because it's it's jointly administered by both management and labor we've got committees we've got subcommittees we've got special committees that work on you know on special projects when we identify different market shares and we we will bring in experts from both the contractors in from the workforce and help develop training programs to respond as Mike said as quickly as possible we identify a need we moving as quickly as possible to to address that need to give both the contractor and the workers the skills they need to go out and capture that you know the emerging markets sure you know the industry is constantly changing what was hot today may not be in a year and a half from now and I think if you look historically at your facility I mean you talked about telecommunications back in the 80s today it's electric vehicles I mean it just changes so fastly so the ability to adapt and grow and on a moment's notice be able to get in there and make you know changes to curriculum important to you agree do you agree with that absolutely i mean you mentioned telecommunications i mean judge greens decision on the deregulation of the utility we virtually almost overnight had to change our model we were not in the data business like the regulated phone companies were so to speak but with that decision we had to write the curriculum we had to get our apprenticeship program approved i think when we were the first program in the country first in the country we had the first Punisher program approved both by the state and the federal government and that was done jointly we put our heads together we got industry professionals we wrote the curriculum we had to get it approved and we were up and running a relatively short period of time and we benefited greatly both the Union in the contractors association because of that relationship and being able to look forward the electrical industry a term that people talk about at least within the unionized sector as you earn while you learn and I think it's important for that because of on-the-job training and also the schooling that you get in the classroom but you guys recently made some changes to how you actually administer your training in terms of the hours that the students are actually in school it used to be at night after the day was over maybe just talk about the changes and I guess why that was needed we changed like you mentioned society changes in the nighttime learning is I don't think it's as productive as it as it used to be with the changes in the household and the 22 people working in the family the other spouse is going out the door literally as one has come to the door so the nighttime learning isn't as productive as it once was and so we've looked at it jointly and this is the first year we created a day school so from here on out the first-year apprentices this year for 26 weeks will go days and so it's day time learning I think it's better learning it's not after a long day's days of work whether it heat and cold and and up early out to work and so we think that this is the time to switch and we did and from here on forward next year the first years and so would be first and second and and so on so forth they will be going days we think it's it's better for today's environment that buzz word I heard Mike say a couple times that answer productivity going I think from the contractors point of view that's very very important to the effect that that a worker gets the job and is either well rested ready to go I mean sometimes these jobs start very early in the morning and that's not uncommon maybe just talk about that from the contractors point of view that productivity is really important to make sure that the job gets done when it says it's it's going to be done by well absolutely and I think that in the move to the day school and you know just to elaborate a little bit on that I mean we have a terrific facility and a lot of the move the day school is to utilize that school to its maximum capability and that the need for knowledge is constantly changing in in lifelong learning as a concept people have heard of and it's something we really stress so it's not just that the apprenticeship program at the starting but journeyman training and update programs and so those guys they're pretty much working on the day so you know so that we're going to still utilize the facility for in classes for that but the day school another thing to the big aspect there is that training is so important we feel we can get people trained quicker faster so they can be more productive faster so much is the job site demands are such that it's not like the old days of the journeyman and The Apprentice that could really spend the time teaching kids how to learn the trade it's so fast-paced today that you know we've got to move a lot more of that training into a classroom situation stuff that was happening on a job so that's another reason for why we're doing what we're doing we hope that we're going to get a better product better trained people quicker trained more productive on a job site faster and better for the whole industry there there's that always that question or the back and forth about who's more productive in terms of which labor force union or non-union and you know on this website there is a video which sort of recaps a study done by independent project analysis where they looked at hundreds of projects apples-to-apples comparisons really looking at the same job Union and non-union and they did figure out speaking to your point gland that unions are seventeen percent more productive and it's largely due to the training they receive you want to expand on that at all Mike and kind of what that means in your world yeah it's no surprise to me because we of course we see it and as you said it's on this page I think it's safe to say it's to my left the link to my left the productivity study that Ed moroz mean group did it's important to point out that that was not that truly was an independent study that group that did that was Curt was part of it and they are they are not a anti-union they're not a pro-union and so it truly is one of these independent studies and we know all independent studies not really independent but it it showed that the productivity in the organized sector was seventeen percent more and he also goes a step further on on wages and benefits why why the unionized sector can get paid more and get better benefits is because of that productivity so it's not all the hourly rate someone can make half the wage have to benefit but if the competition is twice as productive then it's it's really it's equal well and you get into the whole aspect of how it's built and you know better training better skills better safety that also comes into the equation you're going to have a better product at the end with that in mind there yeah well the safety is a big piece of that and Glenn and I we work hard at it with in the training facility with with training and Glenn had some great stats going to you want to share those on the workman's comp changes what they are today versus not so long ago yeah we were talking earlier about training one of the things that we've really focused on training in the last 20 years or so is safety training we train every one of our people is through been through OSHA 10 we teach them OSHA 30 we've got we just put the entire workforce through 70 e which is the NFPA standard on dealing with live circuits so we've really focused on training very significantly we've got you know confined space training so on and so forth and it has paid off that really has paid off at construction industry electrical industry in particular is a much safer industry not saying that it's you know it's still construction I still drew you know it's still you know one of the more risky businesses to be in as they say when I building gingerbread houses out there but still it's a much safer than it was 20 30 years ago I was just looking at workers comp rates and workers comp rates today for electricians are about a third of what they were back in the early 1980s and that's a testament to you know how much safer it's not you know and it's it's the you know focus on you know safety with the contractors they've all got safety officers now they really focus on it and that's a part of you know one of the things that we should be proud of as an industry that we have made our industry a lot safer because as we say you know the goal is that everyone goes home to their family at the end of the day and there's a hidden costs that the most people don't see that the employer has to carry for comp so when you're with you know when you lower your your comp by a third there's a there's a real economic value there that returned back to the employer in the customer as well this summer as we turn into fall this summer you boss Tanika and I BW Oklahoma three or your contract was up and you successfully renewed it let's go ahead and talk about that a little bit the process and now that it's that it's over with what the new contract entails well I'll start off I mean negotiations and collective bargaining really I mean it's what we do I mean for 100 over 100 years the ib w has represented electrical workers and for over 100 years nika has represented electrical contractors that employ a VW electrician so that cold collective bargaining process is what brings us together and it's really the focus of what we've done but over the last hundred years we've grown so much from that point the JTC in exam is a prime example of how much we've grown from that so now negotiations you know they're always hard work there's nothing easy about it there's no shortcuts but we're really happy we signed a five-year agreement which was you know very unique in the industry with this uncertain economic climate you see most of the agreements in the collective bargaining coming at one or two-year agreements at the most we buck the trend five-year trend five-year agreement which I think speaks volumes to our relationship in Boston the commitment both from the Union and from the contractors a commitment to the future to say okay let's get this behind us and focus on the future that you know that that the business development working on training our people you know transitioning a day school bringing in these new concepts that you know help contractors get work in a poor more people that's really what we're all about well it sounds like teamwork is a good descriptor word that you guys would like to use for that yeah partnership teamwork it negotiations I mean certainly it's it's not something that's pleasurable to spend your whole summer in negotiations and trying I and out of contract but this is the second consecutive five-year contract that that we've been able to ratify by both by both parties and it certainly I think speaks to the trust and the relationship I think why some employer associations are demanding the one in two year I think anybody sees the construction industry rebounding that quick so I think from the employers point of view you know across this country they feel more comfortable with a one or two-year contract but you know I'm I'm ecstatic with the contract and how it worked out and glad that we can put that aside for the next five years why we're able to negotiate decent contracts i think is i think it's safe to say the employers look at the union as a stable leader in the in the industry just to regress a little bit on the training we purchased a new building right behind the training center so that's going to be a virtual construction site where we can do more hands-on and with that purchase the employers saw the commitment to training and where Glenn was Glenn was speaking to if you can make a second year apprentice tomorrow second year apprentice where yesterday's third year apprentice was than this value there and it's not all in the hourly rate as ed Morrow's study says and as we raise the bar in the apprenticeship we expect more training is better and that's there's value there and that's why I think you know why we're able to negotiate decent contracts in Boston your commitment the team's commitment your partnership to the industry over the last 10 or 11 years in terms of market share has really blossomed and it's I don't think it's any accident you guys are very in tune with that and aggressive on that front that you would during the negotiations I don't think it's anything unfair to say that there was uncertainty there and it showed in the numbers but then once the five-year contract was ratified again those numbers are even better than they were prior I mean that relationship and that people need to know what's going on and have a certain amount of certainty that it's going to be okay yeah well you brought up that point and as Glen represents the employers and on on my end representing the membership we were certainly distracted during the summer and why I'm glad it's five years so Glen was focused in other areas I was focused in other areas we weren't discussing as much as we do targeting certain jobs and how we're going to win them and we had the worst numbers this summer jaron negotiations than we've had I think in five years and I don't think it was by accident the employer is not knowing what was going to be negotiated what was going to be ratified they were a little reserved on the union end we were distracted and not chasing the work like we normally do I mean we really focus in we identify targets our jobs and what do we have to do to win them and we jointly team up and go at this really jointly and how we're going to win the jobs we were distracted and I think the numbers speak to how those distractions can really affect your market share and we don't have that problem for another five years and glad we don't have them on a daily basis where the labor and management and not on the same page so agreement that ratified the last day in August in September's numbers the market share in September in was in the 90 percentile when we could put the contract behind us focus in and what we normally do and we went from the worst to the best month in a matter of 22 months so it's it seems like that the contract or the certainty the renewed partnership it's I mean it's a tool for market share if nothing else you agree well risk is risk is the most difficult thing for a contractor to deal with them and and labor being the most important part of what the biggest part of their bid prices that's the thing that they've got to worry about the most so the contract provides a lot of stability there and I think you're Mike was right that I mean you know particularly in that July August range you know they know it was going to happen on September first so now that they've got you know five-year commitment there they know from that perspective but in addition I mean some of the other significant things that we did on in the settlement was we focused a tremendous amount on the apprenticeship I mean a lot of changes there a lot more focus on we talked about the day school we're increasing dramatically the amount of training we're giving on a tell data branch we're moving a five year program at telecommunications so there's a lot of focus on the training we're going to commit a lot more money to it we're going to you know we talked about the three million dollars we're going to increase that by about fifty percent over the next couple of years so it shows a commitment from the Union and the contractors to that that focus and we added you know some flexibility on the on the workforce area as well that's just another the key thing for employers so we made some adjustments in the way the Union runs the referral also it had some more flexibility there and provide some certainty there some employers can hear again eliminate some risk and hopefully you know focus on gaining market share of business development going after new markets any deadline ya know just really Glenn said it all I mean it's a it's a win-win glad it's behind us now we can focus in on an increase in our market share which we've continued to do for the last I think 12 years we've continued year after year we've increased our market share which is not the case in many industries especially in construction especially in the organized sector of the construction industry we have year after year increased our market share both in the public and private and once again it's not by accident and we've done that at a time we've increased I pay and increased I benefits and how we do that is by working together increasing productivity marketing and a true local 103 nikka partnership thing it kind of sounds like there's a new day you know in the construction industry electrical construction industry in Boston and hopefully the economy will rebound and will follow suit I mean you guys seem like you're you're very primed to go after that on the job front any good news coming out of Boston to get some of the members back to work and contractors back bidding jobs well we're fortunate it depends what economy you're in but we're fortunate in Boston to have a couple of economic engines to be for economic engines the of course the higher education engine is great came to a screeching halt in 08 with the meltdown of the financial industries and their endowments taken a hit like everybody did so construction more or less came to a halt in the higher Eddie the biopharmaceutical industry will lucky to have it it's been it's been slow and but starting to grow again so we're fortunate there the transit area the infrastructure in a subway system and a transit system with budget cuts has been neglected but out of necessity now we asked on to see some more work there in tourism residential those are also engines that we have not in the single-family home market that still has its issues nationwide but in the high-rise rental apartment which was a switch from the condos is is really taking off so the you know the university's javed university just announced last week that they are now going to move forward with their billion dollar life science facility that was more or less capped off in 08 and other universities from Boston College Boston University MIT have it Wentworth northeastern Emerson Suffolk you know we're fortunate to have all those engines they all have aggressive building plans now that they've recovered from 08 and looking forward to that work of course and UMass Boston being one of them UMass Boston great pla they're close to a billion dollars with the work at UMass Boston and that has broken ground and the the Kennedy Center next door for Ted Kennedy that is moving forward both under a project labor agreement and both have broken ground in pla news or union construction news casinos where do they stand well last week Senate 24 to 14 affirmative vote for so House and Senate both voted in favor then now it will get reconciled in conference committee and they will put together a final bill for the governor to sign which we have every reason to believe he's going to sign he's indicated he's in favor of it and once his signature is there the next portion of that will come the committee be developed on the selection of the applications for a casino that's three casinos in the state defined by regions in one slot facility just slots tons of job creation there Glenn would you agree with that absolutely looking forward to it okay 8,000 jobs at peak construction I mean that's an estimate but that's certainly a good sign yeah with all three casinos full-fledged casinos in the slots the restaurant mo two thousand eight thousand construction jobs too / facility and we're biased of course we we've been promoting suffolk downs which in the city of Boston and we fail that they certainly have a better than fifty percent chance of getting one of those applications and and they're going to be ready to go another piece to that is we actually through the relationship that we have with the ownership local 103 through a merger of local 123 another ibew local we will be representing a large portion of the full-time work force there those are the the in-house slot slot people and mutual clerks and waiters and waitresses and so and so forth as well as the area trades maintenance crew we will have full-time work force in there as well maintaining the whole facility and that's all been agreed to and it's just a matter of building it and moving forward with it and moving moving on you know from that two more of the public image standpoint more the advertising standpoint the television radio campaigns that your team my BW nikka team is currently involved in all of that is is absolutely necessary in your point of view but maybe just talk about everything that people don't see in terms of business development work you know setting meetings and developing relationships with developers I mean how how contractors and also ibew folks you know expand their own businesses by being a part of your organization yeah we you know we've jointly identified that we can no longer react and wait for the phone to ring so we we identify projects early on we get involved in the permitting process I mean there's two walmarts that we will be building because we got in early enough and partnered with them as well and said listen we can help you through the permitting process for that we've got an agreement to do those two walnuts and aloes as part of that but we get we get in early and an team with the developer in show that we're not we're not the bad guy we have a good guy we're going to help you through this process and our members that live in these cities and towns can support smart growth and development and and it's been a good thing on changing our image with them not once they get their permits then we we're knocking on the door we get in early and children that we can we can work together on this but anything to eglin yeah and from the contractors perspective I mean much more of the industry is moving to a design-build type of a model these days so our contractors have that capability to help those developers to help divide design to kind of formalize what their project should be kind of help build with budgets and so on and so forth so our contractors are very much involved with that and helping move that process along from the very earliest part of the project from the building trades point of view being ibw one of the building trades and National Electrical Contractors Association being their contractors there's a new saying that they're pushing from coast to coast and that's value on display every day it seems like everything that we talked about here over the last 15 20 25 minutes really speaks to that point and it seems to me just with the last you know couple minutes about business development and the other avenues you know setting meetings getting involved with the bidding process in the permitting process that it seems like it's easy to do business with ibew local 103 and and Boston eco would you agree with that that's always been I think the case dawn but was never it was a story that was never told so certainly jointly we've tried to rebrand ourselves not that a lot has changed we just needed to tell our story so we jointly do radio we jointly do TV we do you know print not as much print as we used to do but we are constantly now telling our story we can it's not the public's job to learn about us it's it's our job to tell them about us so we we rebranded ourselves and we get developers and users once the project's done we asked them if they'd be willing to just talk a little bit about the job and the quality and the craftsmanship and it's nice when a project is done it's not a quid quo pro when it's done you get developers who are willingly interested to tell the story so we do that a lot easy to do business with Boston nikka absolutely we're open for business okay gentlemen thank you for your time today we certainly do appreciate it good back and forth discussion and obviously cooperation and teamwork is it's definitely evident so thank you for your time terrific okay thank you out there tell a friend or 20 about this program there's always something new on the 103 advantage com in fact this site is going to be redesigned to meet the market and always stay ahead of the curve so keep your eyes peeled for that until next time I'm Dominic Giarratano you"

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"VideoID": "895",

"Title": "Electrical Estimating Techniques (Commercial Electrical Training Video)",

"URL": "https://www.youtube.com/watch?v=evlwTYntm1g",

"Keyword": "Commercial electrical construction",

"Transcript": "next take a look at the drawing that we've provided in the handouts for you to download go ahead and make sure that drawings printed out and in front of you now if you need to pause the video and print out the drawing the drawing shows a top view of an office building with two rooms we see that there's lighting fixtures on the left side and on the right and we see that there's symbols for receptacles for data drops for switches and then at the bottom of the drawing we see that there's a panel call it says existing panel 200 amp panel three-phase four-wire 120 208 volt I'll come back to that in a minute on the top right we see an electrical legend showing the symbols in a description of the symbols that are on the drawing we see receptacles and duplex or quad duplex phone step-ups 20 amp switches it shows two by two fluorescent or I should say two by two recessed LEDs two by four recessed LEDs and then it shows how the plan describes the symbols for home runs okay at the bottom it shows it's a commercial office as the name of the project it's this is sheet II one the very bottom and tiny letters that shows the scale at a quarter-inch equals one foot now I'll go on to describe the drawing on the left some more blueprints are one dimensional drawings meaning this is a top view okay there's no mention of how high the ceiling is in this space we're going to imagine it's a nine-foot ceiling but it doesn't say that on this drawing and sometimes on electrical drawings it just doesn't show ceiling height you have to go to architectural drawings for that but you might imagine that or let me say it this way in when you really run the conduit in this you have to go up out of the wall across and even down into light fixtures and then in light fixtures rather than running from fixture fixture you're literally maybe come out of the top of a fixture a little bit go over and down into the top of another fixture same with these outlet feeds okay now we're going to estimate this or I'm gonna ask you to do your takeoff for MC cable okay but but this is going to be MC cable so these dotted lines indicate what conduit in wire or MC cable okay again the a twenty one here the a twenty two twenty three that indicates homeruns okay of course s's are stanford switches and so on so again these are one-dimensional when you're rolling this off I'll show you in another video the tools you use for measuring conduit called a scale X but I just want to explain the drawing in this segment so that's it you'll make a material list from this drawing you'll roll off the conduit measure the conduit count devices I'm going to show you an example of a take off next I also just want to say that if you're estimating any size commercial job you might have lots and lots of rooms like these of course it could be a whole office a whole floor of office building again the purpose in this drawing is to show you the basics of how to use red rhino to do take off and how to do input okay next screen shot is the material take off form again if you don't have this printed out or if you don't have it in front of you go ahead and get it and pause this video this is similar to a material take off form that's provided by red rhino at the top we see the name of the form is called master take off over on the left the job name is commercial office and on the right we took we wrote the section power and lighting okay so down in the material column here is where we wrote the materials then the quantities go in the quantity section now when you're doing a material take off for realz you won't see this assembly catalog information or any of the information down here here's the deal we input or I should say I built this so that you could know what assembly or where to find the assembly for these items as an example here's a 20 amp duplex and it shows that there were eight of them on the drawing now this is a little different perhaps than you're used doing this because now you're gonna count receptacles because when you input receptacles in red rhino using assemblies it's going to show all the parts and pieces needed for the receptacle the Box the plastering the plug the plate etc okay so again on this take off form hopefully you have it printed out by now you this this is an example of making a materialist from the blueprints and then you'll input from this list into red Rhino I'll show you a video on that or videos on that okay so I'm going down this list here 20 amp duplex receptacle 20 amp quad there's three of them 20 amp duplex weatherproof GFI and so on now look here this is the data step up notice that there's five of them let me go back and show you the symbol of that to refresh your memory here I just went back to the drawing to point out some things again as I was describing see these are this this is a symbol for the data stub up over here we see the the phone data stub up designation there thought I had that phone shut off and and so and so on so see we have symbols for receptacles symbols for quad receptacles and all we did was we counted those and put the counts on the take off on the take off form okay I'll get back to the take off form now okay back to the take off form again I'm just counting receptacles counting quads and and receptacles and switches and data stub ups here fixtures and all because I'm going to input using using special tools for red Rhino that puts all the materials in for us now so these are these first few items are shown using the assembly catalog then I'm gonna go into red Rhino and show you how to use the device wizard okay it makes it really fast the input materials I'll show you a couple examples of that use it for the switches then also MC cable I show to use the wizards and specifically the conduit wizard and I'll show you all this in a video but again I set this material take off form so you could go into it read it and then just know where to navigate in red Rhino estimate to input the information again down here further is circuit breakers for s box these are assemblies for 11 box red wire nuts at the bottom I showed where the there is $75 worth of permit fees and I'll show you how to put that in okay next I'm going to show how to actually input these materials into red rhino you in this video I'm going to explain the material take-off process on the right we see the blueprint or the plan page and on the left is the material take-off form now 40 explained the the overview of the plans and the take-off form but I want to explain something rig Rhino has pre-built assemblies I explained this a little bit before but because of that you can just count the number of receptacles and quad receptacles and GFI receptacles and data stubs and so on you can just count them and list them and then when you go and input them into read Rhino it'll it'll display all the components needed for a duplex or a quad receptacle or GFI so long story short is I use highlighters and I highlight I might pick a yellow highlighter and highlight all the duplex receptacles as I count them okay so there's I'd count all the duplex receptacles list them on the takeoff sheet all the quads same thing the quad receptacles I'd count the quads and I'd input them on the takeoff sheet now on your handout just highlight the the different components as you count them so you don't count twice now so we can see that I have I've counted and input items in the takeoff page on the left I also took off conduit now I'm going to explain that in just a few minutes but we see that there's a 12-2 MC cable 140 feet 12 3 MC cable on the take-off page over here 190 feet and so on also circuit breakers now let me explain a little bit about circuit breakers on a honest commercial project a lot of times they have a panel schedule that shows the panels and the circuit breakers so I just go there and count all the circuit breakers to input into red Rhino to capture the labor now here I showed that the circuit breakers cost $18 we're going to input that later ok and it I also input now it's not shown on the blueprints but I added 4's box and a for 2 for 11 boxes and some wire nuts ok so there are certain things that you have to see through the blueprints to know that you need it and also the blueprints are 1-dimensional so they just show a top view if you would of what's going on here they don't show the switch height or the receptacle I again I'm just giving an overview on how this works now I'm going to show a couple tools that I use for doing takeoff I explained to you that I use highlighters so I just get several different colors actually these represent most of the colors I use I use highlighters and I highlight the items on the plans different colors I might highlight all the duplex receptacles yellow all the quads pink all the two before light fixtures blue and so on you can pick your own color code when I color code these items so that I don't count them twice here's another little doohickey I use it's a call - it's called a tally counter some call it a thumb clicker counter but long story short is I use this to count light fixtures and receptacles now the plan that we're showing here is a very small plan but you might have several floors of lighting fixtures or receptacles you have to count on commercial projects or any type of project so I use one of these tally counters so I can keep count what I do is I highlight let's say a light fixture and I click the counter okay and highlight click highlight click highlight click and that way I might keep track and don't count things twice okay now the third and final image I'm going to show you is a plan wheel this is called a scale X now a scale X cost about I don't know $60 or so you can get them at Home Depot last I checked or you can buy them online now you don't need anything really fancy mine's actually black maybe mine's outdated but the idea is is this little wheel here you you let me say it this way let me start over you set the scale of the blueprints on the on the scale X and then when you roll across the blueprints it measures the length of conduit needed or the length of anything so then the digital readout shows you the length that you need and I use this again for taking off conduit so there's two different main brands or scale X and scale master they both work the same and you don't need the expensive digital or bluetooth versions just just a plain version okay so I want to show you that tool that's what you use for tip conduit takeoff now let me go up a little bit further I'm going over on the blueprints here but I want to explain something there's a couple things you need to know as we all know these blueprints are a single dimension right they're not three-dimensional so what I mean by that is we know that the conduit has to come up out of the switch and go up the wall and then across and over to the light fixtures and then a daisy chains light fixture the light fixture that's about the same height right same with the receptacles the receptacles if they don't step down the wall then they have to go up over and down with conduit okay so again my purpose in explaining this is I uses scalex set the scale and I roll this off here's how to roll this off what I do is I usually over roll to allow for the height say I know the distance is 12 feet the ceiling height is 12 feet the switches are about 4 feet so I just roll the scale X across the drawings till I know it's about 10 feet and then I roll over and up say to the light first light fixture and then I roll slightly beyond it called over roll to make up for the amount up that goes down into the top of the light fixture to take off from fixture to fixture I might start down below this light fixture to give a little overall for the amount of MC cable that goes again up and down out of the fixtures so I'll roll from this picture and pass that one again allowing for over or so I should say over rolling allowing for the riser the part that goes up okay so I use the over roll I just over roll to account for the the amount that goes up I do this with feeders with MC cable any conduits now another thing I wanna explain when you're taking off conduit always take off at right angles to the to the so in this case what I would do is as I explained I would go roll down below that till I got to to several feet to allow for the riser and then I put my cursor roller on here my scalex on here I'd roll over and up straight up again at right angles ok so that's it for the rolling or how to take off conduit let me share something else another thing that's important and I won't explain this in great detail but if this is important is is that you you count the number of runs of conduit the definition of a run of conduit is is from an a device to a fixture or from a fixture to a fixture each one of these segmented lines represents a run of conduit now the reason that you're going to want to know the number of runs is is when we input this using the conduit wizard the Kondo wizard is going to show two connectors per run of conduit so you need to count the number of runs now over here on the left you see the 12 - MC cable I show the runs equals 11 there's 11 runs there's a hundred and forty feet total and 11 runs okay so here the 12 3 there was 190 feet total and runs equals 12 now 3/4 EMT here there's no on the on the drawing on the right again it doesn't show the necessarily the type of conduit it shows the circuit numbers now let me cover that real quick ok sometimes blue prints do show the exact size of conduit and wire now in this case I'm making an assumption that the receptacles are all fed with MC cable so are the lighting fixtures okay since the lighting fixtures are a B then the way I I roll this office is using 12 3 MC cable for the light fixtures because they're switched a B in other words they need two conductors to run across through the light fixtures now we notice that the the little arrows here with circuit numbers a21 a.22 23 by seeing the circuit numbers here we can determine the number of 20 amp circuit that are needed okay so the circuit breakers are listed here there's a 5-1 Pole 20 amp circuit breakers listed on the takeoff sheet again it would be good if you just go ahead and practice the take-off yourself see if you come up with a different distance on conduit or different counts than I did on my takeoff okay the fact is is that any two estimators almost on the planet would it would bid this job everybody would come up with a different amount it's just the way it is you want to estimate as close as you can let go practice on your own takeoff sheet and and on a blank one and fill that out okay we provide you with a blank takeoff sheet so you can do that now last but not least of my description with conduit takeoff here is is my point is is that you have a certain wiring method that you use when you're doing electrical projects of how you come out of the panel mostly you cannot come at well I'll say in my in my instance or my experience in California we don't come out a panel so we can't come out of panels with MC cable so we have to stub up out of the panel with three-quarter a lot of times what we might do is bring a 3/4 conduit up over and into the accessible ceiling space set a junction box and then drop down to the nearest receptacle of that circuit or circuits to to catch the circuits feeding these receptacles and that's just what I did on this take off you'll notice that there's 20 feet of 3/4 with five number 12 so what I did again my my how should I say it the way I see it is I would stub out conduit here set a junction box and then drop down into the different circuits ok so so again I explained that sometimes you have to see through the blueprints that's one of the things you have to just know and see through what do you actually need for home runs ok so that's it for this video next we're going to input the items using red rhino you in this video we're gonna start in putting materials into red rhino software but first I want to explain what you see on your screen on the right you can see that there's a drawing and the drawing is highlighted now so as I explained previously when I make a materialist or do material take off I actually highlight the blue print now we're talking about when you're estimating using paper blueprints I highlight the blue print and color coded so as I count items I highlight them so I don't count them twice in this case you'll see that I I color-coded the duplex receptacles yellow the quads are shown in pink and then all the conduit is shown with orange now I ran out of highlighter colors but but the point is is as I rolled off or took off the conduit they are measured it I highlighted it so I don't count it twice now this is a simple drawing but in a real commercial drawing you might see several rooms even ten rooms or more shown on one blueprint page so it's important that you count stuff or highlight stuff to know that you've counted it already so you don't count it twice now on the left again is the material take-off list again if you if you do a material take-off on the example that we provided you're your outcome might be different you might have different links of conduit okay so check my work with your own work now that said on the left hand side again shows the quantity of items the materials of quantities and on the right what I did just for sake of you learning to use red rhino software's I explained how you would use red Rhino assemblies or wizards or product catalog to input the materials normally your material takeoff form wouldn't have anything to the right of quantity there okay so next we're going to show we're going to show how to get started using red rhino software with the material take-off form in this screenshot we see the take-off form on the right and red rhino on the left so I'm just gonna fly through this and show you how to input these materials okay now let me explain something your results might look a little bit different in red Rhino RIT Rhino has material pricing and they update that pricing each month at the end of each month so your prices might come out different okay so I'm not going to highlight what my prices are versus your prices my idea is to show you how this thing works and how you can use the assemblies to to estimate a lot faster so follow along and input the materials into red rhino I always like to start people at the estimate list so assuming that you're logged into red rhino this is the homepage you see on the screen on the left and I want you to start by creating an estimate so you're gonna go to the left and click the list estimate button or rather it's a link click on list estimates when you do it'll open up and show you all the estimates that you have in red rhino now you'll see I have other ones that I've used for training or examples here I'm going to click the new button at the top right do the same thing click new to create a new estimate now I'm just gonna fill out and I'd like you to do the same I'm just gonna fill out the minimum amount of fields needed to get going and that is you just have to type the name of the estimate in here I'm going to name it commercial estimate now of course if you're doing this for real you would actually put the name of the estimate in here and don't ever mess with the material pricing over here on the right just click the Save button to create a new estimate and when it stops spinning you'll see the estimate listed in here now next you're going to create section or sections the purpose of sections is a breakout pricing we're just going to create one section for this example so you go down to the right lower right here click the new button it opens a window type in the section name now again I have other videos to show you the use of sections and I'm going to show you those videos in a minute here but we're just going to name it power and lighting okay and then next I click the Save button just do the same ok then it saves this is where it's time to rock and roll and input the materials so we see the section name on the left to the right you see a link says view take-off rights under takeoff it says view and takeoff edit we're gonna edit this takeoff so you click Edit takeoff okay now I'm going to walk you through actually inputting the materials from the material takeoff page I'm gonna walk you through that but here's what you need to know at the top click on video clips okay and then it has three columns you'll see at the top commercial residential and structure cabling so if you want to learn to estimate any of those disciplines commercial electrical residential electrical or low voltage which is structured cabling you would watch the respective videos for commercial you would watch the first video there John Kelsey introduction to take off and then the videos down the left-hand side watch each and every one okay or residential you'd watch the videos down the middle okay or structure cabling same thing you watch the videos down the right-hand side okay now that's it I'm going to walk you through now the material take off part of this again back to the tank our sheet you notice that there's a list of items down one side down under material there's a quantity and then on the right again I took the time to write in how you would find those items so 20 half duplex receptacle or rather 20 amp receptacle let me say 20 amp duplex there's eight of them it says assembly catalog 200 commercial industrial 14 we show what I mean over on the left start by clicking the Assemblies button and when you do it opens up a list of assemblies now this is pretty self-explanatory right here this is the assembly catalog so again on the right it says assembly catalog 200 so we'll click on 200 for commercial assemblies and then it says 14 receptacles so under category receptacles we'll click the plus sign next to 14 and it displays several different options for receptacle assemblies now we're going to drill down in this and input these assemblies again the take-off page the right shows eight of them okay you should be able to see this bigger and better now so we're gonna drill down into receptacles plastic plates and it'll display the receptacles on the bottom now I'm gonna grab this line right here just put my cursor on it left click hold it down I call this on the squid ink to move this over so I can see where the items are now when you're inputting any devices you want to make sure and be mindful of if there's a specification grade you'll see the list of receptacles here there's specification one and spec two and standard now we're going to be looking for a 20-amp standard I happen to know that's assembly number six so just scroll down to assembly number six see how the description shows one receptacle 20-amp standard 120-volt now just for your sake I'm gonna do something here I'm gonna go click I'm gonna just go put one of these in and I'm going to add it and you don't have to do this but I want to explain it real quick this is how the assemblies appear okay it'll show a description at the top let me just click Save so you can see this I'm gonna go back and delete it but I just want you to see how this works this is how the assemblies work the assembly for a duplex receptacle includes a 4s box of plastering some mounting hardware just $0.50 for mounting hardware the duplex receptacle the plate ground pigtail and some wire that's okay so this is what one assembly consists of now I'm going to go through and delete these and just go in put eight of these assemblies as was shown on the takeoff sheet okay so here I put eight for the quantity and assembly number six again it reads receptacle 20 amps standard 120 volt Pio which means plastic plate frame means it's in an open wall so I just scroll up here at the bottom and click the Add button now don't click the Add button repeatedly because if you do it's going to input a bunch of it's going to import a bunch of assemblies here you just want to click Add once let it appear on the right and then click the Save button okay so when you've done this a few times and know what you're looking for this gets this process gets really fast okay but notice again it it input for or I should say eight for s boxes eight rings eight times $0.50 for mounting hardware and receptacles eight receptacles and so on okay so when you input multiples of these assemblies it shows or displays all the parts needed for all the assemblies now I want to make a note of something else on this specifically specific assembly look sometimes you choose to use some kind of spanner bracket or caddy bracket or some some type some type of item that that spans the studs to mount your 4s box to to edit this you'll simply click on it let's say I use a caddy bracket that cost four dollars and fifty cents just click on this line click Edit I'm going to change this to four dollars and fifty cents instead of fifty cents click change it to 450 and click Save okay now one explained something real quick here look look at the line two which is the 4s box okay it shows eight of them look the way the program is set up is it has national average pricing what they call national average pricing for materials several thousand materials okay so that shows the unit price and you have to be aware of the unit of measure next to that see how it shows the dot that the price of the four S boxes is fifty eight dollars and four cents per C that is Roman numeral C it means the price per hundred and so since we input eight of those it displays a price of four dollars and 64 cents for all of these it does the extensions for you now here's another thing rid Rhino has a labor catalog when you input labor or I should say when you input something it inputs the labor with that item with that material item it pulls it in from the labor catalog and shows the labor hours now eventually we're gonna we're gonna see a report that shows the total labor hours I'll show you that in a few minutes but it shows that it shows that the program shows point two three hours to install a four four S box so it shows the labor for eight of them the extended labor is one point eight four hours now guys again you have to pay attention to the unit of measure here there's basically three of them in red Rhino and I'll show more as I go along there's efore each we've already seen see for a hundred right 400 and then there's em for a thousand so II for each Roman numeral C means per hundred and Roman numeral M means four thousand you'll see that in cable or wire it's gonna price and do labor per thousand feet okay let me go on to the next item the next item we see on the takeoff sheet is the 20 amp quad it shows a quantity of two now they're in the same category if you will of the duplex I'll show you those in Rhino okay if we scroll down a little further in this assembly category we're gonna look for quad assemblies okay so you see the one in parentheses on these receptacle assemblies but two in parenthesis means there's two of the devices okay which will be a quad we're gonna scroll down I happen to know that they live at number twelve assembly so number twelve here shows two duplex 20 amps standard so there was what two of those on the takeoff sheet we put input quantity a to scroll up here click Add and then when it populates to the right we're gonna save it there we go populates to the right again this is the way the program displays assemblies it shows it shows that the the name of the assembly the items in the assembly and it ends with a dash line to separate it from the next entry I'm just going to click Save to save my work you okay I'm sharing the takeoff sheet here with red rhino again next on the list is a GFI I should say a 20 amp duplex weatherproof GFI okay so again it shows assembly catalog commercial industrial 14 receptacles now we're already on 14 receptacles but we're going to go look under a new category again the description of this is it's weatherproof see the wp that's what that stands for there was one weatherproof GFI and now I'll show you how to input that okay weatherproof receptacle assemblies are in the same category under 14 receptacles here but over here on the left you see that there's a category for weatherproof 14.3 is what it is currently so I'm going to click on receptacles weatherproof and it's going to display weatherproof receptacles now again what's important is we find the right assembly here now I'm gonna scroll down real slow and show you what that is see we have a receptacle GFI here's a one-game GFI receptacle 120 volt weatherproof now you don't know this by looking you'd have to input this receptacle assembly to know this but I happen to know that that assembly right there is a is going to be a bell box with a bell box cover we want the one that's a framed receptacle with a weatherproof cover look at here 42 a let me scroll down a bit here 42 set to a says it's 1 GFI frame wall receptacle 120 volt weatherproof and the the designation here means that it's a wall-mounted box okay so we're gonna input that one so I'll click on it oops well I didn't mean to do that but you know what when you do click on the names of these it does show you the components in the assembly I didn't even mean to click there so now you know if you click on the name of the assembly over here on the left it will show the contents in it now to close it you have to click the little red X okay let me go on and just put one of these assemblies in so I'll put in a quantity of 1 scroll up to the top here and click Add let me move this back over here a little bit and click Save so in this instance what this did was it input the 4s box the ring the hardware the mounting hardware the receptacle and a weatherproof single receptacle cover ok so that's for that item next on the list is a data step up now to the right it shows there's a quantity of five of them I'll show you these assemblies these are really slick and it's assembly catalog 200 that's always commercial industrial ok fifty-five phone data stub up so a quantity of five phone data stubs show you something here when you're in the product catalog or assembly catalog and read RINO you can click the little negative sign to collapse the menu I'm going to do that now I'm going to collapse the menu for receptacles by clicking the little negative sign here and I'm gonna go down to 55 phone data stuff now this doesn't have a plus sign next to it that just means there's no sub categories I'm just going to click on it and it'll display the assemblies at the bottom now I'll show you specifically which ones I'm going to put in here but just notice this notice that it has an assembly with a one gang ring with a pull string ok just a ring with a pull string it has a two gang ring with a pull string and so on there's several assemblies in here look at this one it's a one gang ring with 10 foot of 3/4 inch EMT read through these yourself come in put some different ones so you understand what's in here now in this case I'm looking for one with a four S box a ring and ten foot of 3/4 so here's a one gang ring with ten foot of one-inch right above that is is two gang ring again these are still in the rings I'm looking for a four S box so here's one for s deep box one gang ring with 10 feet of three-quarter-inch EMT I'm gonna use that one I'm gonna go put five a quantity of five in here now I'm gonna scroll up and click the Add button it'll populate to the right let me click Save and we'll go over a description okay now see how fast and easy this is look at--look with it the input or I should say look what the outcome is from inputting that assembly it shows the description of the assembly here line 20 it shows 4's deep box with certain size knockouts here we input five of them five assembly so there's five of those five class rings 50 feet of three-quarter-inch EMT set screw connector for the box conduit supports 70 feet of eighth inch pole line see it put a pull string in there for you and it also put an insulated bushing on the side that stubs out okay these are slick assemblies again when you get used to using these you'll fly through the input of these guys okay next on the takeoff sheet is fixtures okay now without without me telling ya just pause the video for a second just see if you can figure out where the assemblies are for lighting fixtures okay just pause the video for a minute okay the take off to the right take off to the right shows nine two by fours and three two by twos now we're gonna go in put those at the same time so over on the left if you guessed fixture assemblies you're correct that means light fixture assemblies I'm going to click on the plus sign next to ten now you'll notice there's subcategories here there's recessed and surface mounted LED and fluorescent there's recessed incandescent surface incandescent exit lights and outdoor fixtures the best way to actually learn what's in these assembly catalogs is to go drill down into them and input them now we're looking for two by foot two and two by four recessed LEDs so I'm going to click on 101 recessed LED now you'll see at the top here may have different assemblies down at the bottom left I should say the top of that list what I call a laundry list here the top two items are two by four LED with parabolic lens and 2 by 2 led parabolic lens now they have different types of lenses in here frankly the labor that it puts out is going to be the same for two bittu's and for two-by-fours mostly with the exception of if they're their emergency fixtures its emergency pictures is gonna it's gonna display a little bit more labor I'm just gonna go put in what would it say the take off sheet says what read yours it says nine LEDs two by four and three two by twos okay I'm gonna click add populate it to the right I want to explain something further about this now we're going to show you later I'm going to show you later about this notice how it shows the fixture here the quantity and it shows a zero for the number of dollars for fixtures you have to get these quoted and you have to put the fixture quote into the estimate I'll show you where at a later video here okay so next we just want to go up and click Save I'm going to scroll it back down so we can look at this okay so see we input both fixture assemblies at the same time let me explain something real quick about this see how it it shows the two before LED it shows a quantity a 0 again we're gonna get that quoted and we're gonna input the quote into the recap I'll show you that later but notice that it displays 0.6 3 hours of labor to install one of those fixtures 0.63 late labor hours okay that means it's just a little bit over a half an hour right 0.5 hours is a half hour 0.75 is 3/4 of an hour or 45 minutes okay so it also output the output also was to ceiling wires or they've called earthquake wires sometimes for each fixture now let's say it's a lot of times when I when we're bidding a commercial rather I should say public jobs like for the state or county or city they require one fixture I should say one earthquake wire one ceiling wire per fixture if so I would edit this number and just double it okay I'm not going to do that here but that's what I would do if I had to let me just go up and save this and I'll scroll back down okay okay so back on track here again so the rest of the input here it shows nine whips it shows three dollars and 85 cents material for each whip and point one zero hours 0.1 hours not very much labor and it also input the wire nuts for those here same thing for two by twos it displayed the two by two fixture labor only the earthquake wires or ceiling wires fixture with and wire nuts okay that's the way these assemblies work again the the best that way to learn to use red rhinos to just drill down in some of these assemblies and go input a quantity of one over here and input it over on the right and just see what components are in the assemblies this saves you a ton of time okay now back to the takeoff sheet the next item is a one gang and two gang switches okay 20-amp it shows a quantity of one of each okay two gangs switch and one gang switch now I want to explain something real quick we have switches also in the assembly catalog okay for under 200 for commercial I'm going to just use the device wizard to show you how to use that you can use wizards or assemblies to input a lot of these devices stuff like plugs and switches okay so we're going to use this time a wizard that's something different that you haven't seen yet so over on the top left you're going to start by clicking on the Wizards button when you do the Wizards will populate on the left side you'll see a lot of different wizards here go experiment with these there's an alarm wizard automatic transfer switch wizard a circuit breaker wizard now I prefer to use two input circuit breakers in a different place but go play with this and see what so you see how it works okay there's a bus duct wizard conduit wizard condit wizard is something you'll use a ton okay now we're going to go right to the device wizard I'll just click the little arrow to the right and the wizard will open on these pop-ups you always start at the top and work your way down if you see a fine button you'll always want to click the find button when you're done with the selections on the top here and that's what we're going to do so first we're going to input one one gang 20 amp switch we're gonna set the drop-down at the top for 20 amps the grade we want to just be standard see the different grades in here of course there's no GFCI switches but just click standard and it asks for the plate and the box type okay so these are both plastic plates and frame boxes next we're going to click the find button you always have to do this so it populates down below now what it did was see how populates the different switches here now this is another drop-down that you're going to work inside of see how it populates switches or outlets or twist lock receptacles or dimmers or J boxes so this is kind of a list of all different a several different symbol assemblies that you can input here I'm just gonna work in switches okay but if we wanted to we could put outlets in here instead of using the Assemblies okay so let me proceed with that okay at the top under switch here I'm gonna click the drop down okay now just take a look at these it'll make sense what these are but look at this first item is a 20 amp one pole standard switch assembly or I'm sorry switch okay so again we're using the wizard but this is going to input one switch look it says 120 amp three pole motor switch 120 amp 3-way standard switch and so on okay so I'm just gonna click on 20 amp one pole standard switch I'm gonna populate it with that now on the takeoff sheet it said that there was just one of those so I'm gonna put in a quantity of one click the Add button and it will populate them as parts and pieces down here on the bottom let me close the window and show you I'll close the window and save so we'll notice the output here lying 40 here it shows about the same output as an assembly doesn't it so again wizards are just another way you can input devices if you choose to use the wizards so it input 4's box a plaster ring mounting hardware one switch plate a pigtail and some wire nuts okay next we're gonna go input or find the two gangs which can we open the device wizard and set the settings at the top and fine so we set the settings at 20 amps standard grade next we'll drill down in the switch drop down find the right switch again we're looking for a two gang 20 out click the drop down we're looking for a two 20 amp one pull standard switches right here to 20-amp one pole so this program has has one pole to pole three pole clear up to six pole switch assemblies or switch wizards okay in wizards so I'm going to click on that just put in the quantity if there was five I put five there's only one in this estimate I click I put one in the quantity and click Add populates down to the bottom when it populates I close the window and click Save usually when it saves the screen flashes here we see again the description on line 49 is two switches standard grade so here's this is interesting it shows a one for S box a two gang ring see that they're a two gang ring mounting hardware two switches one two gang plate and so on so these whisper posit there T's Wizards make it super fast to input the materials okay here's a tip for you I recommend that you click Save after each entry if you happen to not or let me say it this way if you happen to go input a hundred or two hundred lines of materials in here without clicking save and you get happy you happen to get knocked off line or accidentally go off line then in that case you will not you'll have to go re-input all those materials again so always just click Save if it's easy to do that next we're going to get into the conduit wizard on the takeoff sheet we see that there's an entry for 12 to MC cable and 11 runs here so it looks like it's 140 feet now the description over here shows conduit wizard it shows wizards and Kondo wizard now we already opened the wizard for devices we're gonna click on wizards here or if the wizards are any tests are not already displayed here you're gonna click wizards in this case they're still here so let's just click wizards so you know to do that if you need to we're gonna select the Condit wizard I'm gonna click here to open the conduit wizard conduit wizard is something that just saves you a ton of time once you've done this a few times it gets really easy to make these entries now so that said I already showed you where the training videos were but if you open this conduit wizard and want to know what to do you can click up here this little contour this little camera and click on that and watch a video how to use this I'm gonna fly through this you start at the top with a conduit wizard always and then you click find when there's a fine button always so we're gonna click the drop down and find MC cable notice the different types of conduit here PVC GRC coated PVC they call that Rob Roy some people call that Rob Roy EMT rigid MC there's our MC cable I'm just going to click on it now now with MC cable it's a little different input than other types of conduit you only need this type and size at the top you don't need fittings of course because they're not EMT fittings so you click the drop-down that says sizing what you want to do is scroll down here past the six inch and you'll see 14 - that's 14 - MC cable 14 3 this is 12 - with a control fire and see that if you're if you're needing to make drops two switches 4 with control wires you'd use that one in this case we see 12 - 12 3 these are the two entries we're going to be making I'm going to click on 12 - then I have to click the find button to find that material now MC cable is a lot easier to input here because you just need the total length of all runs here and the number of runs the rest of this stuff doesn't matter or affect it so in this case we said on the takeoff sheet there was a hundred and forty feet and the number of runs was eleven so here we go we're gonna input the 140 feet here one four zero number of runs there was 11 now with this you just want to click Add you again don't click add multiple times it'll input it multiple times click Add one time now when you see the entry on the right you can just minimize this wizard or or just close it I choose to minimize it because we're gonna go back and input some work onto it and then notice this see how the program shows 12 - MC cable with green ground you input we on input 140 feet it shows the price per M here like I told you conduit and wire and MC cable is priced per thousand feet that's what that Roman numeral M means okay now it shows the labor at something different one point nine hours nine three hours one point nine three hours to install per hundred feet okay so again using the conduit wizard I'm gonna click Save and just go back down there we go use the conduit wizard for MC cable we're gonna do that we're gonna input the 12 three go ahead and try and do that yourself pause this video and see if you can go use that conduit wizard set it up kind of the same way I did but use it for 12 three MC cable and there was a hundred ninety feet and I'll and 12 runs pause the video and try and do it yourself okay how did you do I'm gonna go reset this now wizard for the 12 three let's see how to do it here so that it's already set up for MC cable because I just minimized it and open it again so I'm going to click the drop down I'm gonna find 12 3 MC cable and click find again with MC cable you just put in the the total length of all runs and number of runs in this case it's 12 3 it was a hundred ninety feet one nine zero and number of runs was twelve one two so I just click the Add button populates to the bottom and click Save simple as that next we're going to go input the three-quarter inch row now I'll just say it I won't show it this time but the program shows or rather the take off sheet shows is 20 feet of 3/4 with number twelve is okay and two runs now let me say it again we'll open the wizard will open the conduit was we're gonna start from the top down we're gonna start from the top down and look for EMT so click EMT in this case we want to setup the type fittings okay set screw diecast let me explain this real quick set screw diecast set screw steel weatherproof diecast weatherproof steel that's your compression connectors or couplings right those are compression fittings weatherproof stands for wtp stands for weather then is I should say I tier stands for insulated throat if you need if you need insulated throat fittings then you choose those I'm just going to set it up for set screw steel and I'm gonna set the size for a 3/4 inch as shown on the takeoff sheet and click find now in the training videos we show you how to use this Condit wizard for feeders and branch but in this case we're just going to input this little bitty two two little bitty runs to Stowe about the panel so I'm gonna just fly through this guy's do watch the other training video okay so we're gonna click the conduit application and set up for Plus 10 feet that means the conduit is above 10 feet off the floor next we're gonna put in the total length of all runs in this case it was just 20 feet so we'll type in 20 the number of runs was 2 we want that so the program shows how many connectors are needed now it's already set preset at number 12 stranded and I'm a minute I'm going to in a second I'm going to go input the quantity or in fact let me just do it now it was five number 12 but I want to show you something else when you click the wire drop-down you scroll down and you'll see at the top is a 12 stranded and solid below that is some thermostat wire below that is fire alarm cable see that and then it starts into the copper wire 16 14 10 and 8 and it goes clear up to 750 MCM okay so look this over it has all different sizes of conduit if you're doing grounding wire it has bare copper wire here you would select that and it has aluminum wire if you need aluminum for feeders and it has cable if you're doing structured cabling okay at the very bottom just so you know if you need a pull string you would scroll down to the bottom and select a pull string now I'm not going to populate anything in here I always just shown you that so you know about it so I'll just click away and it won't input any any other type wires okay now what I want to explain here is wire make up length the amount of wire this program inputs the number of feet of wire make up that you put there the wire make up length is defined as the amount of wire sticking out beyond the end of the conduit to go to the termination point look if you're coming out of the top of a panel sometimes it might have to go I go three feet down to terminate to the circuit breakers in this case it's set for a foot in half I'm gonna make it three foot so I just set that now I'm not gonna put elbows quantity because three quarter conduits bent in the field if I was doing feeders I would count those and that's shown in our videos I'm just going to click Add I'm going to close the wizard I'm gonna go up here and click Save scroll down now let's look at what the input is here okay notice that it input conduit couplings connectors supports and total photo footage of wire now it shows all these items with labor and material cost and does your material extensions and labor extensions okay so see we input 20 feet of three-quarter it shows the price of three-quarter per 100 feet the total amount or the total cost for those feet of conduit and the number of hours with extended labor okay hope that helps next we're gonna go input circuit breakers okay and look at your takeoff sheet notice there's five one pole 20 amp circuit breakers shown on the takeoff sheet we're gonna go in put that next in the product catalog okay now when we left off over on the left-hand side we left off with using Wizards so I'm just gonna click the drop down you want to click the drop down and select product catalog okay I want to I want to just interject a reminder here in order to learn to use red rhino it's really critical path that you watch our training videos they're called video clips you click on video clips I always explained already explained this but to estimate commercial you watch the videos down the left hand side for residential down the center structure cabling down the right hand side really important to watch those videos it'll help you get your mind around how this works how to navigate and make it fast now I'm just gonna drill down into product 8000 but let's look on the takeoff sheet that's what it shows product 8000 one zero one five circuit breaker termination let's go look for that click on product 8000 can you find the circuit breakers at 1 1 0 1 5 take a look I'm going to scroll down here click on parata's circuit breaker termination labor right below it is wire termination labor something else you'll probably be inputting on many estimates click on circuit breaker termination labor and it populates the circuit breakers this is a time when I like to unsquare just left click and pull this over ok so we're just going to go in put a one pole 20 amp circuit breaker and it's right here I want to show you something it's important you know this so if you just scroll down real slow you'll see one pole to pole and three pole circuit breakers clear up to three pole 4000 amp look in each size or any time I should say any time you have to input circuit breakers into an estimate you always want to input them all right here at the same time usually what I do is I go to the panel schedule I take off all the panels and I input them I take off all the circuit breakers in input and we have we have training videos on that but just make sure that you go count all the circuit breakers on the job we're doing a small example here of just five to one full 20s but you might literally put in hundreds of circuit breakers okay so back to the subject here there's circuit breaker termination one pole 20 I'm gonna click in that box and there's just five circuit breakers so I'm gonna put a quantity of five and click Add now I'm gonna scroll over here and I'm gonna click Save then we'll come back down and look at that there we go so guys again with circuit breakers it does not have the material price in here now I saved this I should have waited and input it on the takeoff sheet I showed that the cost of those circuit breakers is eighteen dollars okay now of course if your price is something different you would go in put it here I'm just gonna click in on this line I'm gonna go up here and click on the edit button and when I do I'm gonna scroll down it lets me edit anything on this line now the editing videos are the videos how to edit this or delete anything is shown in the video clips I told you about but in this case the price is $18 so I'm gonna put in 18 here okay now this says see quote over here let me scroll over says see quote I'm gonna remove the word see quote see quote is a note to yourself to get them quoted and put the price in for the quote but we're just going to populate this a small project let's say I know what the cost of my circuit breakers is I put it in here 18 bucks a piece scroll up to the top and click Save okay now we're getting near the end of this list aren't we how are you doing with this are you comprehending how this works do you see how using assemblies and wizards really speeds up the process trust me when I say when you go through this a few times and do it a few times it gets really second nature and you're able to really input this stuff very quickly next we're going to look at assemblies here it shows a 4s with blank and a 4:11 box with blank cover and they're both in assemblies 200 so we go over here and click on the Assemblies button click on 200 for commercial now we're going to look for 4-inch square boxes these are assemblies we're in the assembly catalog we want a 4s box assembly there's one of them that we put in here with a blank so we click on it look here it shows a 4s box with a blank cover one gang ring two gang ring and light ring so again I just want one of these guys I'll put in a quantity of one click Add populates to the right see how similar this works you just find what you're looking for input it and it shows the it shows the output of materials and labor while I'm at it right without saving I'm just gonna go over here and click on 411 box assemblies and you see again there's four eleven sixteenths with a blank cover one gang ring to gangrene I'm gonna go put two of these guys in which is on the takeoff sheet and click Add and then next I'll go click Save so now that time I made two entries did night without saving it's safe to do that but I wouldn't put hundreds of lines or even dozens of lines in there without clicking the Save button in the product catalog it describes it as seven thousand four two three you click on the drop down to get to the product catalog let me scroll up here click on 4,000 or seven thousand to open it go down to four two three wire nuts again forgive me if I wasn't sharing my screen a minute ago click on wire nuts you go input the total quantity that you want this case it was two hundred you click the Add button and when you do it populates over to the right and shows the wire nuts okay so again the next video is going to be on the recap portion of this and I'll show you how to use that in another video"

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"VideoID": "899",

"Title": "Electrical apprentice tool box (commercial)",

"URL": "https://www.youtube.com/watch?v=7S0H-vI06G8",

"Keyword": "Commercial electrical construction",

"Transcript": "i brought all my stuff home because our jobs shut down for a couple weeks and i love watching these videos so here's my stuff like my boots i got these timberland pro pro series i don't know they were like a hundred and like 160 bucks or something like that they got up in like the first three days i think i've busted the toes because i was crawling around under the floor for most of the time so uh that happened but they're pretty good i don't know i got no complaints with them um so those are good then i got these in my knee pads i was doing a lot of crawling under the floor again um they're pretty good they're like 20 bucks at home depot they got a lot of padding but they the problem thing i don't like about them is like i don't know if you can see it well but this angle here is kind of uh like when you're crawling they'll they can like hook to the side or whatever you know what i'm saying they're not like i kind of wish it was more flat because uh this is it rolls at this angle here if you don't land perfectly straight so those are those i got my phone number so i covered it up i had i got this whole pack out box on black friday uh i'll show you my old tool bag it's actually in the bottom all right so first i got this also on black friday uh the klein allen key set uh i've borrowed people's before so i haven't actually used mine yet but i've borrowed it from other people and i mean it works it's good i like it this black friday i haven't used it yet but um i have a different level but it's cool because like if you're bending pipe you can attach it on and then it's got your it's got the flat it's got 90 45 30. and those magnets are really strong really good um pen this usually stays my best some fine tip sharpies which i never use i have a orange and a brown to go with the yellow i don't use them though this knife is pretty good i used it a lot my first couple weeks i haven't used it in a while just because of what we've been doing two hands to open it because it's kind of a it's not easy one but i don't know it's clan brand and uh it's worked real well for me the thing is that this thing doesn't lock down anymore it's not uh tight anymore so i can't clip it on i just gotta put it in my pocket if i'm carrying it but it's cool and then we got the it's like a mini fastback it's a smaller one um i got this i think i got this on black friday too which i use a fair amount um it's cool works i had an old one i had a heartbreak as my last knife and uh nothing beat the hell i've got these black and decker drill bits i've had these for a long time since before i got this job um i don't know they work they're good enough that i haven't bought nice bits yet my tape measure it's cool it's uh i like it because the tape is real fat like you can go [Music] like i'm touching the wall right here i can't i thought there you go now it broke i know it didn't and check it out on the back you got phase table and conduit bending multipliers right now which is pretty cool and one thing i really like too is the magnet is super strong it's got a magnet on the end so if you drop like a screw or something i just got the magnetic not these bits but the driver bits so it's not much of a problem anymore but if you drop like a screw or something in a spot where it's hard to get this thing i just use that and i grab it um these gloves they give us these gloves for free that make us wear them a lot of people don't like them because they're they're pretty thick i guess but i like them i mean they're they're not too bad and i i don't want to up my hands you know so i like those um three pairs of channel locks i think i got like a nine inch one and a half inch and a 12 inch i'm pretty sure good to have i really don't use them that much i've used i've used each of them a few times though um this stuff oh no this has come in handy a few times i'm glad i have it just a adjustable wrench and then so these all came in a apprentice kit it was 100 bucks at home depot so i got the klein side cutters i keep these in my pocket i use them all the time i love these things so many zip ties stuff like that strippers these are good i like them linemans wax stuff with them and the needle nose i like all all four of these tools i use a lot especially these so it came with those four plus two screwdrivers came with these two screwdrivers here just a phillips and a flat i have never used these but all four of those tools are 99 bucks they're all six of them are 99 bucks for the whole thing um which i don't know i recommend getting that if you're getting into this because pretty good deal i got this thing too it's a thousand volt square tip or a thousand volt insulated square tip which i've only used it once but it was cool two old beater screwdrivers i carry this one with me my pocket this this uh flathead it's just come in handy a lot so it's the walmart brands but they've they've been real nice actually this one got chewed by my dog uh this thing here i think it's the 11 in one heavy duty multi tool i love this one too i definitely recommend getting this if you're starting with this it's got a phillips head two square tip one this nut driver i can't just look at them and eyeball the size but you know i just put it on the thing and figure out if i need to go bigger or smaller so i got that and then you flip the flip the thing around and you got well first what is this quarter inch and a phillips one another nut driver there and then you flip this around and you got two more things but i was screwing in a box or something i was screwed in a box and it must have not been all the way plugged in because when i took my hand down it the other bit fell out i don't know where the it went so i gave up on looking for it um but yeah so then you got this nut driver here and we got this one here so it comes in handy a lot just carry this thing around pretty often and then i got duct tape and electrical tape this actually was just in my pocket and i went home with it by accident but uh yeah i got those and then i got these on black friday i love these uh four driver bits i got what is this brown one 7 sixteenths three eighths this one i've used the out of it's awesome and then this is 5 16 and quarter inch so that's the top number what's up next up we got that's my old level the walmart brand you know i've used it and it works the magnet is super weak uh but i mean for i probably paid a couple bucks for it so i shouldn't hate on someone this thing i wanted to like it's an energizer flashlight but it sucks man you can put brand new batteries in it and it's still it just craps out all the time so something's broken about this i don't even know why i still have it in my box i should get rid of it a pen this is bronze tip that was cool i love this thing too i'm so glad i bought it this uh impact driver actually i got these two as a kid so i got the impact driver i got the hammer drill driver this thing's my favorite though um [Music] it's dewalt hammer 22 ounce it's been great and this thing's i've had this thing for a long time too the walmart brand uh socket set and you know what too it even has this see i was borrowing i was borrowing square tips they're not square tips i was borrowing uh star tip bits but turns out i've had them the whole time i didn't even realize until fairly recently but yeah this thing's coming handy it like nothing's broken so probably for the price i would say it's good but i don't remember what i paid for it and then in the last the last last and least so i don't really have anything in here we got the leather gloves for pulling i was like we use the big mc like the big-ass mc so we use these to pull them because uh just to not get the other gloves dirty so that way we don't you know touch the equipment and get everything else dirty afterwards got those i got this charger and my old tool bag the hyper tough brand where inside of it i have my old knife tube this thing's piece of i got like i spent like two days just stripping wire and uh it got botched i mean this thing broke off i had to unscrew it and take it and put it back together this piece of but whatever um so yeah i still carry this thing with me because say i don't want to just i don't want to log this whole thing around you know so sometimes i'll just put a couple tools in that and that's that um and last thing this headlamp here milwaukee headland i love this thing it's really good i think it costs 60 bucks it's got five settings you kind of got to use the weakest one otherwise i mean if you've got long days you got to use the weakest one otherwise it does kind of quick but if you use the weakest setting it'll last you all day um so yeah that's that that's my stuff see"

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"VideoID": "905",

"Title": "INGENIOUS SOLUTIONS IN THE CONSTRUCTION INDUSTRY",

"URL": "https://www.youtube.com/watch?v=cTILgs55iPw",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] this is techla considered by many as the world's first ecos sustainable 3D printed habitat tler is a groundbreaking construction made using multiple 3D print operating simultaneously it utilizes crane wasp a modular multi-level 3D printer designed for collaborative architectural Works each printer covers an area of 538 sare ft allowing for the fast construction of Independent Living modules the entire structure made from 79 cubic yards of locally sourced biodegradable and recyclable natural materials consumes less than 6 Kow of energy teas construction took 200 hours of printing using 7,000 G-Code commands to form 350 layers each 0.47 in thick with a total Extrusion length of 93 Mi designed by Mario cinella Architects and engineered by wasp techla represents a new circular housing model it can adapt to any climate making it carbon neutral and suitable for various environments its structure composed of two domes serves as both roof and external cladding optimizing ther thermal performance and material efficiency this Innovative model was created to address the Urgent housing needs arising from Rapid urbanization and population growth tla's potential to serve as the foundation for autonomous Eco cities makes it a sustainable solution to modern housing challenges inspired by the potter wasp wasp has been pioneering 3D printed construction since 2012 their maker economy starter kit which includes multiple 3D printers enables efficient and Sustainable Building practices the project merges advanced technology with natural materials creating homes that are both High performing and zero waste offering a scalable eco-friendly response to the global housing [Music] shortages next looking at JCB htd5 dumpster the compact walk behind diesel powered mini dumper packed with features for efficiency and ease of use now the 2023 Model includes an electric start Caesar data tag two-speed tracking and a 1,12 lb lift capacity JCB has a tipping height of 57 in it can unload directly into a skip or high-sided vehicle designed for tight spaces it has a maximum width of 27 in allowing it to pass through standard doorways the 5.9 GP diesel engine ensures reliable performance while the 33.5in undercarriage adds stability made for both manual and electric start it's quite suitable for a wide range of tasks the htd 5's hydraulically operated skip handles heavy loads with ease and its high tipping height provides excellent unloading capability the two-speed tracking allows for precise slow movements in tight spaces and faster speeds for traversing sights a standard track lock prevents creeping on slopes ensuring safety htds maintenance is straightforward with just a pullout engine cover while the Caesar data tag adds an extra layer of security paired with a JCB micro excavator the htd5 can access restricted areas like backyards thanks to its narrow Dimensions this combination of power and compactness makes the htd 5 essential for Builders landscapers and local authorities work working on smaller projects such as driveways patios and [Music] Foundations polyurethane foam is an effective solution for lifting and leveling sinking concrete this Advanced method employs high density lightweight structural grade polymers rather than than the traditional mudjacking approach which uses a mixture of concrete and mud the polyurethane foam method requires smaller injection sites eliminates the risk of messy blowouts and adds negligible weight to the underlying soil ensuring no wash out it is also environmentally friendlier as the foam does not degrade or contaminate soil or groundwater with harmful chemicals Studies have shown that polyurethane foam can last over 1,000 years in landfill like conditions used in major commercial projects such as roads Bridges and industrial buildings this foam is strong and permanent it can handle heavier traffic and more demanding applications than residential concrete surfaces the foam fills voids under the concrete lifting and stabilizing the slabs making it a cost-effective alternative to complete concrete replacement concrete while durable can sink or become uneven due to poorly compacted or water saturated soil this can lead to safety hazards and damage to a property value polyurethane foam is a permanent fix that prevents further structural damage with the foam's durability waterproofing abilities and affordable cost it offers a great solution for homeowners needing to correct sinking or uneven concrete without breaking the [Music] bank the Box Cita is a 375 ft modular foldable home capable of Rapid deployment equipped with a kitchen bathroom living area and bedroom space it includes essential utility hookups such as water electricity internet and sewage the Cita offers a full kitchen with appliances like an oven stove microwave sink refrigerator and HVAC as well as a bathroom complete with a toilet shower and sink it also features 8T doors and 9 F6 in ceilings and large windows that allow for natural light designed for Easy Transport the unit can be unfolded on site in less than a day it starts at $60,000 and has already attracted more than $90,000 reservations signaling strong interest in affordable housing Solutions since the Factory's Inception boxable has built over 600 units and continues to scale production with plans for new factories and future building system featuring stackable modular room designs for diverse building types Box's vision is to revolutionize housing by using mass production techniques similar to the automotive industry with plans to raise $1 billion for expansion boxable aims to tackle the housing crisis by providing affordable quickly Deployable homes that could serve various purposes including disaster relief and Workforce housing through upgraded equipment and automated processes boxable aspires to make housing more accessible and cost-efficient on a global [Music] scale and this concrete core drill bit system is the US saws core easy a highly efficient ergonomic solution for core drilling capable of handling holes up to 10 in this lightweight system Weighing on under 50 lb is compatible with both corded and cordless grinders it includes key components such as a grinder coupling gearbox hex Corbit adapter guide post and water feed tube the system works with us saws cor bits ranging from 3 to 10 in in diameter and requires a water supply of less than 1 gallon per minute additionally users need a 0 point 375 in masonry bit and a rotary or hammer drill for setup the core EZ stands out by using a center guide post which anchors to the wall or floor this ensures direct downward Force when drilling leading to stable precise cuts the core stays attached to the bit thanks to the Anchor bolt eliminating the need to catch the core once drilling is complete setup involves mounting the grinder onto the gearbox and sliding the core assembly over the guide post drilling is performed by turning a 0.75 in wrench advancing the bit into the concrete while while holding the Grinder's trigger the system supports Advanced features like an offset grinder which supplies direct gearing to the core drill bit providing excellent stability the downward Force applied from directly above ensures straight precise drilling tested at the World of Concrete the core e proved to be highly stable and efficient allowing users to drill in smaller hard-to-reach places while controlling the core throughout the process thanks to the center anchor bolt system [Music] next looking at geoc Cross a flooring solution made from fully regenerated hdp plastic designed for airfields and drivable surfaces each tile measures 22.8 in x 22.8 in x 1.4 in and weighs 3.3 lb with three tiles required per square yard the tiles feature a closed surface of 60% and are UV stabilized for durability it shares a loadbearing capacity of 100 tons per square yard it provides High Resistance and stability tested and certified to International standards with production control tested to ISO 9000 geoc cross is installed by simply laying and rolling the tiles into the ground ensuring complete embedding for Optimal Performance its embossed surface ensures excellent wheel grip and stability while also promoting effective rainwater permeability this makes it ideal for stabilizing grass surfaces while allowing for the safe Transit of vehicles the product offers several advantages including High load capacity quick installation and non-slip surface ensuring soil stabilization and safe vehicle Transit simple lay the grids hook them together and press them into the soil with a roller creating a durable and non-slip surface suitable for various applications it is commonly used for ultra light runways access for service vehicles and soil stabilization in driving and Transit areas it was used in major projects like San Francisco International Airport Industrial sites in Cambridge the Avo Club in chiti the port of palmo and framlingham castle in the UK [Music] and the Dutch titane offers a quality EPDM products including bottom adhesive specifically designed for EPDM applications this adhesive is ideal for large EPDM jobs allowing for single-sided gluing and covering up to 215 sare ft it can bond with various surfaces like B tumin OSB boards wood underlayment boards P insulation concrete and EPDM itself the adhesive comes in a 6.6 lb package and is compatible with European EPDM which only requires gluing on one side unlike American EPDM which must be glued on both sides titane EPDM products are known for their durability lasting over 50 years they are widely used in roofing for flat and slightly sloping surfaces as well as for covering gutters due to their water resistant properties the materials are also effective for airtight construction which helps Main maintain energy efficient and comfortable indoor temperatures supporting modern Sustainable Building practices BNG as a leading EPDM wholesaler titane supplies highquality EPDM systems without the need for primers saving time and reducing costs the company's EPDM products are designed for both new construction and renovation offering an environmentally conscious solution to building needs with a vast supply of EPDM foil adhesives and accessories titane ensures consistent instant availability for large- scale projects resistant to all weather conditions titane EPDM provides long-term protection for any [Music] project this is Makita DWD 181 lithium ion cordless multi-surface scanner it offers powerful scanning capability across multiple base materials detecting embedded objects such as metal wood plastic and shielded electrical wires up to 7 in deep it features selectable modes for dry concrete wet concrete wool partitions wood or drywall and Hollow block with a multi- detection mode that scans in three parallel positions the large 4-in illuminated interface displays the center edge relative width and depth of objects a laser guide enhances accuracy while an LED light improves visibility in dark areas this tool operates with makita's 18 vlxt lithium ion batteries and 50 W Motor ensuring up to 50% more runtime faster charging and extended motor life thanks to Star protection computer controls weighing 3.74 lb the scanner includes an interlocking storage case for portability it features an ip54 rating for water and dust resistance along with extreme protection technology xpt to withstand harsh job site conditions its dimensions are 11.81 x 15.72 x 6.3 in the scanner is compatible with makita's expanding 18volt lxt system offering versatile performance across trades the brushless motor provides longer life and the system is protected against overloading overheating and overd discharging note that the tool requires one 18vt battery not included with the fastest charge times in its category ensuring maximum effic [Music] efficiency the motto of this skilled gunsmith is simple if you can explain what you want we can bring it to life specializing in custom projects and accessories particularly with Glock pistols his expertise has earned him a reputation among firearm enthusiasts one interesting project came from a conversation with a fan of Milwaukee the iconic American manufacturer known for its power tools Milwaukee which has been in business since 1924 has built a loyal following thanks to its durable Reliable Tools this particular Milwaukee fan had a unique request to customize a Glock 34 9 mm pistol in the distinctive style of the brand drawing from Milwaukee signature colors and design the gunsmith transformed the firearm into something truly oneof a kind blending precision and creativity to craft a custom piece that reflected the client's passion for both firearms and power tools the project didn't stop with the pistol customization though as a bonus the gunsmith added a fun and functional accessory to the mix a battery powered revolver screwdriver priced at just $20 this handy tool features six interchangeable bits and is powered by a 600 mamp hour battery it's not just a conversation starter it's a practical and affordable addition for anyone who loves Milwaukee tools or custom [Music] Firearms next we have the spider tie concrete wall forming system which is a product designed for Simplicity and efficiency in Concrete Construction it uses 6in 8 in or 10-in ties along with specialty screws and Alignment tools to create a framework for attaching plywood similar to fastening drywall to studs this system accommodates curved and straight walls and can be applied to swimming pools retaining walls tall or short walls and various other concrete structures no expensive forms are required and since the heaviest component is a single sheet of plywood labor is greatly reduced the system employs coar thread screws to fasten the plywood and its webbed design allows concrete to flow through forming a solid monolithic wall while holding rebar in place without needing tie wire spider tie is particularly suitable for forming curved or Serpentine walls quickly making it ideal for complex structures such as swimming pools the system's internal form supports are designed to withstand hydraulic pressures during pouring ensuring no weak spots in the wall afterward spider tie eliminates the need for large investments in specialized equipment and offers a versatile solution for foundations basement walls roofs outdoor kitchens and garden walls with less labor Time Savings and easy tolearn methods the spider tie system outperforms traditional methods allowing Builders to create any shape or size wall with minimal effort [Music] paying a visit to the German kyber's modular construction system and it offers Advanced technical features focused on sustainability and efficiency the buildings provide the highest thermal and moisture protection quality with optimized material selections for durability ease of Maintenance and resilience against weather fire sound and Emissions the process integrates CAD cam planning with certified construction under controlled conditions ensuring systematic commissioning steel a material supports a cradle to cradle approach offering 100% recyclability and relocation capabilities minimizing environmental impact the use of low emission recyclable materials and energyefficient Manufacturing methods further enhance ecological sustainability modular buildings by clurg are highly thermally insulated with low life cycle costs due to their largely maintenance-free design they offer flexibility as they can be relocated or repurposed providing value stability and options for reuse functionally kyber's Modular Buildings use quality tested materials that enhance indoor climate room Acoustics and reduce susceptibility to faults ecological considerations such as minimizing waste during production and returning residual materials to the recycling cycle are essential to their approach location planning also factors in environmental influences and the space optimized construction uses less floor space than traditional methods [Music] further we have the rokamat chameleon Universal machine a tool with a 1,000 watt motor that operates at 150 to 570 revolutions per minute powered by a 230 volt corded electric Source it includes a support plate with a diameter of 7.8 7 in and uses aluminum oxide grit with a grit number of 80 the hand tool weighs approximately 4.85 lb while the total weight is 11.68 lb this lightweight design ensures comfortable its dual counter rotating discs provide smooth operation on large surfaces while the adjustable suction Hood allows for dust-free work and prevents surface damage ideal for delicate materials so its technical specifications include a motor power of 1,000 watt tool rotation speed between 150 to 570 revolutions per minute and a plate diameter of 7.87 in the chameleon is compatible with a wide range of accessories and features continuous speed control for optimal tuning across different applications this machine is suitable for grinding eifs etics boards stripping wallpaper removing old paint and adhesives flattening concrete and cleaning surfaces it is also ideal for smoothing concrete base plaster and scratched finishes among others the chameleon excels in versatility offering solutions for woodworking concrete plaster drywall and fresh concrete applications included with the machine are four Emory K 16 pieces and a durable case for protection and transportation thanks to its strong torque and low speed of rotation the chameleon ensures powerful performance on walls ceilings and Floors providing professional Craftsman with a reliable multi-functional tool for a variety of demanding [Music] tasks moving to the drywall sander a super high performance corded Electric Tool powered by a 6.5 aamp motor which delivers variable speeds from 500 to 1,800 Revolution Solutions per minute this sander comes with a fine grit rating of 64 and is equipped with an automatic vacuum system allowing for up to 98% dust absorption through a 6.5 ft flexible dust hose and a dust collection bag ensuring a cleaner work environment the sander features a 90° pivoting head and floating head design which allows for automatic adjustment on uneven surfaces and easy sanding in corners and ceilings it includes LED lights around the the base providing clear visibility in low light conditions the Locking switch enables continuous speed control reducing pressure on the motor during extended use the rubberized ergonomic handle enhances grip while the extendable handle which can be folded or removed allows for portability and Easy Storage this drywall sander seems as a great for sanding grinding and polishing drywall interior and exterior walls ceilings floors and for removing adhesives paint Coatings and loose plaster the package includes 13 sanding pads p120 X6 P320 by7 a hex wrench screwdriver two washers Two Joints a 6.5t dust extraction hose and a dust collection bag [Music] switching to an eco-friendly Energy System by installing solar panels on the Roof sounds great but does this necessarily mean destroying our roofs by drilling holes everywhere solar stack is an Innovative solar panel mounting system that ensures no holes no leaks and preserves the roof's Integrity while offering unmatched strength and wind resistance this patented system uses a spray polyurethane foam adhesive to attach the mounting pedestals directly to the roof eliminating the need for drilling and meets the strictest wind codes in North America and provides a lightweight fast solution for solar installation cutting installation time in half it is compatible with various roof types hence it works on sloped Roof Systems like tile and metal 22 gauge or heavier within hvhz and flat or low slope Roof Systems including granulated cap sheet bu modified bitumin TPO EPDM PVC hippon SPF concrete and metal however it is not compatible with shingle Shake architectural metal metal shingle tile Etc or silicone coated roofs there are three models of solar Stacks the standard 8 ft is designed to provide secure mounting with zero roof penetrations keeping roof warranties intact for additional support the Standard 12 ft that offers 50% more uplift resist resistance the system also includes tilt kits a 5° angle tilt kit SKU ss8 tk5 and a 10 a 10° angle tilt kit SKU ss8 tk10 that allows solar panels to be installed with optimal slope solar stack has revolutionized solar panel installation solving common issues such as leaks and warranty voids caused by traditional methods [Music] this system uses EPS thermal insulation material to create permanent form work that is energy saving fireproof sound dampening and mold resistant it provides continuous insulation fire resistance and soundproofing making it ideal for small homes to large commercial buildings the interlocking ICF blocks eliminate ther Bridges ensuring uninterrupted insulation and High Energy Efficiency reinforcement is essential for creating a strong unified reinforced concrete structure supporting diverse architectural designs concrete adds Superior density and strength making the building structure durable and resistant to external elements ICF technology enables the construction of nearly zero energy and passive buildings by providing consistent insulation and minimizing thermal bridging which reduces energy consumption and building maintenance costs the system's insulating properties cut Heating and Cooling expenses offering long-term savings ICF structures can be built even in Winter conditions down to 10° F if the concrete used is suitable for the temperature construction is Swift with approximate to 1,000 ft building taking about 3 weeks to complete with a small team ICF offers design flexibility a accomodating various architectural Styles including large windows and Corner openings it also ensures excellent sound insulation beneficial for residential homes hotels and offices the non-toxic materials used in ICF promote a healthy indoor environment with stable temperatures and improved air quality through quality ventilation systems the process results in a durable monolithic structure that doesn't require additional insulation [Music] moving to the permm and it produces highquality insulated metal panels imps for temperature controlled environments these panels consist of a metal skin laminated to an insulating foam core providing exceptional thermal and moisture control they are available in various widths and profiles including Mesa light Mesa classic shadowline and sleek and come in thicknesses ranging from 4 to 8 in with r values up to R8 per inch perms panels offer excellent Energy Efficiency durability and sustainability reducing energy consumption in Cold Storage food processing pharmaceutical facilities and more permm provides two types of panel joints permac cor HF a hidden Fastener joint for exterior walls and permac cor CS a cold storage joint that minimizes air infiltration and thermal Bridging the panels can be customized with siliconized polyester paint for added durability these panels cores include expanded polystyrene EPS which offers high moisture resistance and long-term thermal efficiency and polyisocyanurate polyiso known for its Superior insulation properties and compliance with EPA standards the Gen 4 closed cell poly technology ensures no off gassing and maximizes R value per inch The zlock Joint system available with permac cor prevents air leakage making it ideal for freezers and other controlled environments permm seems to be the only manufacturer North America offering both EPs and polyiso panels with this technology further enhancing their industry-leading insulated metal panel systems for Architects contractors and Facility Owners [Music] electreon is a leader in Wireless electric vehicle charging providing an electric Road system ERS that enables EVS to charge while driving or stationary through inductive technology copper coils embedded beneath roads generate a magnetic field that transfers energy to receivers installed in EVS eliminating the need for plug-in Chargers and large batteries this system supports Dynamic charging while in motion and static charging while parked significantly reducing battery size weight and cost the technology helps extend EV range lowers total ownership costs and facilitates the electrification of public and Commercial fleets contributing to sustainability goals by reducing greenhouse gas emissions so basically cars receive energy through receivers installed underneath them which interact with the magnetic field generated by copper coils embedded in the road transferring electricity wirelessly via inductive coupling electreon launched the first public Electric Road in Detroit Michigan in 2023 with plans to expand Global projects include electric bus routes in Tel Aviv test tracks in Sweden and Italy and similar initiatives in Germany these systems are designed to ease the transition to Electric fleets with a focus on public transport and Comm commercial vehicles Distributing energy demand across roads to relieve strain on the electric grid electreon charging as a service model allows municipalities and Fleet operators to adopt wireless charging without upfront infrastructure costs through flexible payment options including monthly subscriptions or payper use models operators can Electrify their fleets affordably making the adoption of this Innovative technology more accessible electron's vision is to create a Global Network of electric roads accelerating the transition to sustainable [Music] Transportation looking further at the orange Thunder with K20 technology hand float which is a tool designed for concrete floating featuring a 16-in blade made of K20 engineer neared material it is 3 in wide and 3/8 in thick with square ends and rounded Corners to prevent gouging the Blade's low surface friction allows for faster smoother movements while its curved surface lines ensure even distribution of the conrete paste keeping the surface open longer the K20 material is highly impact resistant corrosion proof and prevents liquids from being absorbed ensuring durability and easy maintenance an aluminum bar reinforces the the blade for added strength and durability mounting the patented proor soft grip handle the 9 and 3/4 in handle is designed with enhanced texture ribbing to reduce user fatigue and improve grip even when wet the hand float is bright orange making it easy to locate on busy job sites this tool excels in lifting and leveling materials gripping concrete surfaces on inclines without drifting downward it opens the surface more quickly and keeps it open longer reducing the number of passes required for a smooth finish its corrosion resistant blade resists chemicals and rust while concrete doesn't stick to the surface making cleanup simple with its high impact resistance and ergonomic design the orange thunderhand float ensures efficiency and long- Lasting performance on demanding construction projects [Music] next the ge2 NL a professional two-hand ratchet tool designed for blind rivet nuts and bolts manufactured by goal gmbh built from forged steel this durable tool is ideal for both commercial and private use measuring 8.27 in in length and 8.15 in in height the go12 N weighs 2.51 lb making it compact yet powerful it accomm accomodates gut sizes from M3 to M12 and go bolti sizes from M5 to M8 providing versatility across various materials the tool comes with one jut M5 to M12 and additional sizes such as gut M3 M4 and goalt M5 m6 and M8 are available separately its handle made from a combination of alloy steel stainless steel and copper ensures both strength and comfort during use the specific dimensions of the tool are 8.27 in in length and 0.79 in in width making it easy to handle in different working environments goal's go 12n represents over 40 years of expertise in riveting and insulation technology produced with state-of-the-art measuring and testing equipment it guarantees Flawless product quality the tool is suitable for a wide range of applications offering precision and reliability for setting blind rivet nuts in professional and home settings [Music] alike moving to the p331 plastic strapping tool a battery powered device created for heavy duty strapping applications using polyester strapping with widths ranging from 3/4 to 1 and 1 1/4 in it features a 36 VDC lion battery allowing up to 370 strap cycles per charge it weighs 14.5 lb with the battery and it offers adjustable tension between 270 and 1,575 lb with a tensioning speed of 1.5 to 2.5 in/ second the p331 friction weld ceiling achieves average seal strength of up to 75% depending on the strap quality making it a reliable replacement for steel strapping in high tension applications the Tool's brushless motor requires minimal maintenance and the automatic version allows for more efficient operation the p331 is well balanced for various strapping positions and features a quick battery exchange for ease of use in demanding environments for more it operates well in both low and high temperatures and is equipped with battery cell management for extended performance with dimens I of 15.6 x 6.5x 6.9 in the p331 is compatible with strap widths of 3/4 to 1 and 1/4 in and thicknesses from 0.024 to 0.060 in it delivers consistent tensioning and sealing with adjustable settings for optimal results this tool includes a 40 volt lieon battery and charger and offers a significant cost savings by by eliminating the need for SEALS or air powerered systems its durable design makes it a quite smart solution for industrial strapping needs"

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"VideoID": "908",

"Title": "VEVOR 42 PCS Lockout Tagout Kits Electrical Safety Loto Kit Includes Padlocks Review",

"URL": "https://www.youtube.com/watch?v=t0lXb7VUz\_w",

"Keyword": "Commercial electrical construction",

"Transcript": "the veva 42 PS lockout tagout kit is an essential safety tool for any workplace focused on electrical safety and Hazard prevention this comprehensive kit includes everything you need to secure energy sources and ensure that equipment maintenance is performed safely first and foremost the quality of the materials used in this kit is impressive the padlocks are sturdy and reliable ensuring that your equipment remains locked out effectively each padlock comes with a neque key which adds an extra layer of security preventing unauthorized access during maintenance the bright colors of the locks also make them easily visible reducing the chance of accidental re-energization in addition to the padlocks the kit includes a variety of lockout devices compatible with different types of Machinery from gate valves to circuit breakers this kit is versatile and can be used in multiple settings the inclusion of tags is also a great feature as they provide clear warnings and instructions regarding ongoing maintenance the organization of the kit is another highlight the items come neatly packed in a durable carrying case making it easy to transport and store this portability is especially beneficial for teams that work across various locations however while the kit is comprehensive it's worth noting that users may need additional items for cific applications depending on their unique needs overall the veva 42 PCS lockout tagout kit is a valuable investment for enhancing workplace safety it combines quality versatility and convenience making it suitable for a wide range of Industries whether you're managing a factory a construction site or any environment with electrical hazards this kit provides the tools necessary for Effective lockout to Jes investing in this kit is a step towards ensuring the safety of your team and compliance with safety regulations"

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"VideoID": "909",

"Title": "Shanghai Residents Weep as Typhoon Scatters Glass and Cladding; China’s Shoddy Construction Crumbles",

"URL": "https://www.youtube.com/watch?v=ruzEOYsZX-U",

"Keyword": "Commercial electrical construction",

"Transcript": "a high-rise building shows extensive damage with numerous Windows blown out by the typhoon and curtains billowing in the wind as a man exclaims in shock an entire balcony window is ripped away sending household items flying around the typhoon blasts through the apartment leaving people scrambling to close bedroom doors in another unit the balcony's glass doors were blone away leaving the apartment empty as residents huddle in Corners gripping doors and walls in fear of being swept away our house is wrecked all the glasses shattered everything is blown away our furniture is gone on September 16th typhoon binka finally departed Shanghai heading toward jangu Province leaving behind a trail of Devastation the typhoon red Havoc houses were destroyed thousands of trees were uprooted leaves covered the streets cars were crushed by Falling trees roofs were blown off houses and even small dogs and cars were thrown into the air street signs were ripped from the ground leaving Shanghai in a total state of disarray shanghai's s Jang old town was severely flooded with pedestrians wading through the water a war collapsed prompting a woman to cry cry out the war fell down there were kittens under there I fed them every day she called out repeatedly but none of the cats responded the Fallen War crushed several cars even the donkey back Paul and Ponder sculpture at Fudan University was toppled by the wind the typhoon caused widespread power outages and internet disruptions in multiple areas videos show rooftops flooded with electrical repair workers trying to manage the situation in shanghai's pong the aftermath of the typhoon Left Behind nothing but rubble a worker's rented home lost his entire roof netizens tried to console him saying well at least the W is still there brother trees were uprooted and lay in the middle of the roads blocking Vehicles glass panels contined to fall from high-rise buildings rooftops were stripped and large chunks of War plaster C crashed to the ground shocking onlookers scattered everywhere were overturned electric scooters a piece of flying metal struck a moving car wrapped around it before the strong wind carried the metal away again green houses in shanghai's suburbs were torn apart trucks were blown over on the roads and people could barely move cleaning desperately to lamp posts and unfallen trees for safety a large sheet of metal fell from the sky the roof of a house was torn off prompting a man to shout for a woman Inside to get out quickly she rushed out clutching a pile of belongings inside a 34th floor apartment a man recorded the howling wind and rain outside it's terrifying the whole building is shaking like a seene from hell in sudo jangu Province the rolling shutter of a store threatened to fly away with someone shouting run run get away it's about to fall an air conditioner outside a high-rise apartment swelled a few times before finally plummeting to the ground rooftop solar water heaters fell after a few moments of resistance crashing into cars below several Fallen heaters lay scattered on the ground or on top of cars in sudo a high-rise building had its Windows blown out and screams can be heard from a woman in the video the sun rooms of top floor Apartments were blown away scattering glass everywhere solar water heaters on the rooftops were torn off crashing onto the glass doors of ground floor Apartments when a man went to check the damage it seemed like something heavy fell from above striking the floor of the apartment The woman Inside looked terrified in wooi jangu Province streets turned into rivers with white foam on top a nzen joked Wy people are so meticulous even adding laundry detergent to watch the streets however others clarify that wooi has trees called soap berries on both sides of the roads and their fruits can be used to make soap hence the white foam on the water in nantong jangu the suon bridge was littered with overturned trucks in Chango jangu Province air conditioning units on high-rise buildings sway dangerously ready to fall at any moment entire sections of War plaster peeled off and dropped while Windows flew out smashing into neighboring properties rooftop solar panels plummeted to the ground a food delivery driver shouted Against the Wind Brothers log off we can't keep working we'll get blown away another man said I was watching the typhoon when suddenly with a loud bang the wind blew my window out a man showed his shattered solar water heater saying my solar water heater is gone a few thousand wasted luckily I parked my car over there or it would have been wrecked glass from highrise buildings scattered like snowflakes a small truck struggled Against the Wind eventually tipping over tiles fell from the walls shattering upon impact a social media user commented China's skyscrapers look Grand but are made offsh shorty materials this was just a mid-level typhoon and it caused this much damage in one of China's most developed regions the yansi River delta China's State broadcaster CCTV News reported that according to the Shanghai flood control headquarters as of 12:30 p.m. Beijing time on the 16th four houses were reported damaged one person injured over 10,000 trees uprooted or broken 153 power outages and more than 50 acres of Farmland flooded in terms of Transportation 5 77 Railway passenger trains were cancelled 1,461 flights were grounded and 39 Ferry trips were suspended additionally 139 Scenic spots and parks in Shanghai were closed along with two major Bridges the donh High Bridge and the yansy river bridge after tyfu binga's Onslaught the Shanghai fire rescue corpse received 8,429 emergency cores in just one morning primarily concerning high altitude hazards Fallen trees and debris clearance fortunately no fatalities were reported shanghai's typhoon season typically Peaks around September due to its geography typhoons expected to make landfall in Shanghai often skirt the city bringing only heavy rain this time residents did not make special preparations many leaving their windows open when they went out not anticipating that the storm would bring such strong winds and heavy rain reports indicate that the typhoon made landfall at D Lake in lingang pong according to a field report by a journalist from China CCTV the typhoon brought severe 14 level winds 150 to 166 km per hour which damaged workers Huts at local construction sites tore apart exterior walls and overturned steel barriers some media Outlets reported that a couple living in Ming Hong was woken up by the howling wind and rain at around 8:30 a.m. when they checked their windows and doors they saw that the outer wall of a building across the street had been blown off smashing into parked cars below a net E news article described how typhoon binka swept through Shanghai and jangu tearing the glass windows of skyscrapers like fragile pieces of paper sending high altitude debris crashing down like raindrops the article pointed out that what people feared was not the wind itself but the helplessness of potentially being struck by Falling glass and tire Windows War sections air conditioners or water heaters from high rises at any moment amid the storm trees and billboards were overturned everywhere even buildings once considered the most solid proved fragile in the face of the typhoon the article stated that the falling glass from high rises became one of the most shocking images of the storm sparking heated discussions about the disaster on social media people began questioning why despite the numerous high-rise buildings are the city's windproof measures still so weak the incidents of falling glass have also raised new concerns about the city's overall planning in a city like this is the safety of the public truly guaranteed as one local puts it when the typhoon comes everything that can fly flies other commented that typhoon bink's passage was another day of testing China's shoddy construction shaking highrises debris flying everywhere along with power and water outages painting an apocalyptic scene every typhoon every disaster is said to be a test of China's trash engineering earlier on September the 6th at around 4:20 p.m. this year's 11 superai F yagi made landfall in 110 town when H Province it was the second strongest typhoon to make landf in China in the 75 years since the CCP came to power causing severe destruction in hyand videos showed entire balconies and window sills of residential buildings being torn away glass shattering and highrises swaying in the wind creating terrifying scenes many Chinese angrily called the typhoon a revealing mirror for China's shoddy Construction China State media reported that as of 300 p.m. on September the 7th yagi had affected 5261 100 people across 19 cities and counties in hyan Hao and Wang the hardest heat areas suffered direct economic losses nearing 60 billion yen with four deaths and 95 injuries reported however the official casualty Figures were widely believed to be significantly underreported this latest typhoon in ch High a city that prized itself as an international Metropolis blew away so many windows and ripped off so much War plaster is it due to the shorty installation of Windows or is it a problem with the building's quality itself let's hear from a worker responsible for installing the windows the house collapses but don't blame the windows you see you can scrape it off with your hand what kind of developer Built This House people paid Millions for these houses and this is a kind of shoty construction they get look at this wall it crumbles with just a scratch it's a wonder the building hasn't collapsed already so when the windows fall off don't say it was because they weren't installed correctly this is a shoty construction project and it's a new development too angry netizens questioned how did a house like this even pass inspection if you give them 100 million to build this building they could use substandard materials and pocket at least 80 million said another if the windows staller isn't taking the blame what about the exterior War plaster that competes with Windows to see which can fly off faster in every typhoon in China there's a technique called tearing off War plaster by hand have you seen it a new delivered residential development has its exterior War plaster peeled off by hand the extensive peeling of the exterior War plaster left me stunned if I hadn't seen it with my own eyes I wouldn't have believed it nowadays many housing projects only aim to meet delivery deadlines and the quality is simply unacceptable the central mension of the Yul new District in nantong was handed over just half a year ago yet the exterior wall plaster is already peeling off on a large scale the developer solution is patching up the walls with new paint visibly contrasting the old home owners aren't having it they think the developers is just dragging things out until warranty period is over so they can wash their hands of the whole thing actually a while back everyone in the community had already filed 16 complaints because of shwy construction and the property management doing nothing just the underground garage alone has been fixed eight times and it's still not right completely ridiculous netizens commented yajo has always marketed itself as a pure Canal front Community with prices reaching 23,000 y per square meter and this is the quality another said with exterior Wars like this who would be surprised if they're Blown Away by a typhoon as natural disasters and man-made calamities increase more and more shorty construction projects are exposed during these crisis and these poorly built houses are truly shocking and unbelievable a villager dismantled the wall of his new house with his bare hands no cement no mortar just loose soil the bricks inside weren't mored but halfhazard stacked the Villager called the local Deputy Mayor to the scene the official dismissed it lightly and said they sent me pictures this morning well there are some minor issues residents could tear down entire walls with their hands the new houses were already dangerous structures yet the officials insisted these were minor problems reportedly this community has 500 resettlement houses built for local farmers rows of town houses with white walls and gray tiles look neat and appealing from a distance but up close the exterior walls are covered with cracks and patches it's hard to believe these are new houses the villagers said this was just exteria the quality inside the houses were even more shocking look they don't even use mud the bricks are just for show the house is just like dust Farmers spend so much money is it easy for them to buy buy a house in other cases of shoty construction only some parts fail the standards but here nothing meets the standards the Villager pulled out a plastic lighter from his pocket and scrapping the wall casually we paid over 400,000 un for this subsidized house how can something this poorly built keep people safe another villager carried a bag of dust saying it was the mortar between the bricks of his new house rubbing it between his hands it turned into powder a few could bring down the entire War fearing the building might collapse he had to hire someone to reinforce the walls other owners complained that the loadbearing columns in their homes had exposed rebar with construction quality so poor how did these projects pass inspection in the first place another town official stated during the inspection representatives from all units were present and everything passed without issue the official continued to insist that they were minor problems a female villager showed a video of the bricks under her staircase crudely stacked together a light poke with a stick caused the mortar to crumble like powder she said most houses in the community were in this condition an online user remarked you have to be careful closing doors in houses like this or the whole thing might collapse another commented it's not just one place this is happening across the country I took a shovel and it made a hole in the wall the boss told me to quickly plaster it with cement a report by the paper stated that on June the 30th residents of the Greenland inter city space in Duo Hunan complained that the newly purchased Apartments were in such poor condition that they could poke two holes through the floor with PVC pipes and wooden sticks the cement Chucks fell off and it crumbled like sand with just two pokes they spent hundreds of thousands on these school district houses and had to move in for their children's education the developer responded claiming that these were minor quality flaw with holes left during construction for line installation and that only affected the appearance not safety netizens were skeptical asking shouldn't those line insulation holes be filled with something sturdier it's just a cover up I don't believe this is safe shorty construction is terrifying it's as if they don't value human lives recently instances of shorty Construction in commercial housing have frequently come to light to meet delivery deadlines some projects resort to fraudulent means some fire hydrants have no water drainage pipes are non-functional in some cases water leaks into basements causing flooding issues the so-called solid wood eco-friendly security doors when peeled reveal they are made off cardboard rusty iron railings are not to be leaned on on May the 16th a reported that the evergr 4 season Shandong neighborhood in Shenyang was a shorty construction project the drainage pipes were half blocked owners couldn't even reach inside the side tiles along the roads were covered with wooden boards and tiles could be lifted by hand an owner commented this project is absolute garbage in pingtan County fuen numerous Hollow columns were found in a development property residents could pry open the stones in the loadbearing column in the lobby and discovered the bent rebar inside making them suspended columns floors cracked main beams were fractured later patched with cement and cracks were everywhere netizens commented China had the hanging temples in ancient times now we have hanging buildings a Chinese specialty glamorous on the outside rotten on the inside on June the 24th Tower a of the Vani Financial Center in Chan foran shook with presidents describing it as like being on a boat people notice Furniture kettles and even elevator doors swaying inside the whole Foundation was shaking on July the 9th in Leo Yen City Jing the balconies from the first to Fourth floors of a sstory residential building completely detached videos showed exposed bricks where the balconies had been large Machinery arrived on site to remove the remaining balconies nens commented balcony problems in City ities are common simple Calver structures aren't rocket science no rebber connected between the balconies and the floor slabs the protruding Parts should use thicker rebber twice the thickness of what's used on the roof almost every year China experiences multiple Road and Railway landslides due to heavy rainfall on July the 8th the 2.5 billion un restoration project of the Jing River in jeno experienced a slope collapse just 6 months after completion it only took one rainstorm for the embarkment to collapse even though the water level didn't rise some commentators believe that within the corrupt system of the CCP projects are subcontracted layer by layer with a large portion of the costs sioned off by corrupt officials this leaves contractors with minimal funds leading to a frequent cost cutting and inevitable emergence of large scale shorty construction projects [Music]"

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"VideoID": "911",

"Title": "Streamlining Construction Communication with Ron Nussbaum",

"URL": "https://www.youtube.com/watch?v=8YQs6A\_BBcA",

"Keyword": "Commercial electrical construction",

"Transcript": "it was all about developing systems that could scale and we could train people on hey welcome back to another hbac success Secrets Revealed with thus and Evan where we have good conversations with good people sober or drunk how's that cheers to my water super excited to have on Ron nusb npom I probably should have grabbed the pronunciation of your last name I apologize my friend Ron um he's a former Marine he spent a decade in the construction industry working everything from the Jackhammer to running the business uh from there he invested in a residential cleaning company and in 12 months took his investment in 5x to and exited that company before starting Builder commoms which if you think of putting slack and Dropbox together and they had a baby it would be Builder commoms allowing that streamline communication for Consumer and homeowner all the way through to all of the different trades in in everyone of what's going on and having that clear communication all the way through the process um he's also the host of construction Champions elevating the the entire Home Service space the construction space uh with his podcast there just had on a a fantastic guest uh that he released the episode of last week talking about marketing and and things like that so uh wonder who that would we'll put the link in for for that show because it was it was a good one best guest to date for for him uh but no when you when you you mentioned something the communications and I think a lot of businesses a lot of people um misunderestimate the the the fact of communications and how important it is uh to a business like you can have an average product but if you have above average communication you're going to still win because people just want to be heard it's the second that you remove that above average communication even if you have a phenomenal product if you're communication is dog [ \_\_ ] you're out you're gone like they're not going to stick around because that's what people want they just want to be up to dat with things so super excited to be able to dive in and unpack some of the communication parts of what they do and of course Today's Show would not be possible without our sponsors and in no particular order Elite called chirp service World Expo and onp purpose media um so if you want to join us for the most magical contractor experience at the service World Expo in orlandoo Florida from October 15th to 17th um enjoy Keynotes breakout sessions 4-Hour workshops social mixers and exhibit hall with industry lending products and podcasts guess what we'll be there network with other residential contracts in here contractors in here from some amazing Keynotes all design helped contractors like you elevate your business register now and use the promo code secret 100 for $100 off visit serviceworld expo.com to register today and we'll see you there love it hey thus yes Evan you ever thought about outbound your databases to fill your dispatch boards that sounds like a really great opportunity maybe with some lucrative Sales and Service appointments enter aite call a us-based call Center that does just that for over 20 years their dedicated teams don't just make calls they directly integrate appointments into your CRM and fill your dispatch boards don't let your competition get ahead let Elite call connect with your customers first Vis it Elite call.net to learn more I like that let's see if I can parlay into that so hey Evan have you ever heard of the ultimate automation toolbox you it Hows You allows you to capture more leads connect instantly and even Sky recer your sales oh and guess what it does it also integrate seamlessly with platforms like service titanous GoPro which offers automated texts emails and even ringless ringless voicemails so that's chirp uh transform your your home service business with them you can also boost your Google reviews and Customer Loyalty with their proven rehash programs schedule your demos with them today you can get an exclusive 25% off your first three months visit trip.com hssr to start boosting your Revenue today love it and last but not least we have onp purpose media everything from your SEO your p PC and of course the website uh we love working with home service companies and helping them out in any way possible in fact right before this podcast I was with a gentleman from uh California talking about a second opinion audit so go ahead and head over to on-purpose media.ca second- opinion where we can give you some a breakdown of some simple questions that you can bring back to your marketing company to help you move the needle forward and if you decide to stay working with them fantastic if you're looking for other options we'd be happy to be part of that conver ation too but head over to onp purpos media.ca and just make sure that your marketing is on point hey hey welcome Ron Hey great to be here awesome uh Ron thank you so much for taking some time to join us today truly appreciate it um walk us through your journey you uh you joined the Marines came home needed something to do got into construction um walk us through a little bit of the journey here and and I mean one thank you for your service um and serving the country uh not our country because we're up in Canada but America um yeah walk us through your journey yeah absolutely so yeah I was I got out of the Marine corle in 2010 and that it wasn't my plan to get out but my knee got blown out and that's where that's what the plan was so I was sitting around trying to figure out what does this look like in 2010 Craigslist is where you went looking for a job or at least old marines that didn't have anything better to do went on Craig's List to look for employment and I found this Foreman in training ad and it kept I kept staring at it for like two weeks I had never done construction work I worked in auto body before the Marine Corps and one day I was looking in the mirror and I was just like damn it Ron like if you want to go be a foreman you can like you're United States Marine and I applied and I got the job because I was a marine actually everybody else that was being hired would fresh out a construction management school and here I am I have I'm a I'm a grunt out of the Marine Corps with barely a high schore diploma and one tour Iraq like throw me on the job site and uh the guy loved he loved that I was a marine and he he said some of the best people he ever knew were Marines and I hit the job site running with a lot to prove because I didn't know anything like all I knew is like I could show up and work my ass off every day and run circlers around everybody else just by doing that as long as I was willing to Zorb the information and learn about construction and over the next decade is I made my whole life about that like literally showing up working 80 100 hours a week driving an hour every day to and from listening to personal development books to become just a better person and at the same time mastered the construction industry which then led me to moving into leadership roles and then into management as well operations management and Leadership of the company uh and it it all came from the fact that like I knew I could learn everything and outwork everybody and that's what led us to here where we are now same thing with the cleaning company like it was a great a great opportunity and I just pulled the trigger and was like hey we can do amazing things here just by putting systems in place like I'm sure a lot of the listeners out there like your phone might be ringing off the hook but everything's chaos like we walked in to have the first meeting with the lady that owned this cleaning company and it was complete chaos but our phone never stopped ringing and I was like so it's all reoccurring it's all residential and your phone don't stop ringing and she's like yeah it's a disaster like I need my phone to ringing I said no hold on like that's the positive in this business right there and uh all we did was just come in and put in all the systems in place made it easy put it in a position where you could either hire a general manager or run it yourself the guy we actually sold it to worked a remote job in instead of working from his house he just worked from the office that the cleaning company was in and ran the cleaning company and did his remote job and he's like it it's a match made in heaven for him but it's all about just building those systems processes getting that stuff in place and that's where Builder commoms was born out of that is I got tired of getting my ass chewed standing in driveways by customers and not knowing everything that was going on and everything I trapped it all back to came to communication and one night I was laying in bed and it just hit me like a train if I just had a piece of software that got all the communication in one place and then worked as like air traffic controller to be able to direct this traffic get the right people talking to the right people this could solve this problem I got out of bed I put I I call it halfhazard at best PowerPoint presentation so like I'm the software guy that doesn't necessarily understand how to work all the software I'm getting better but uh here we are and that's one of the magical things about what we do is because I only build simple [ \_\_ ] like Builder times is simple to use because I had to be able to use it like it only made sense that the if if you can use Facebook you should be able to use a piece of software and that was our our Mantra from the beginning is like we just need it to be as easy as Facebook like if somebody can send a message on Facebook they should be able to operate and send a message in Builder cons so that brings us here to today and it's what I do full time and also I host the podcast and that's like my passion project now so that's a lot for you guys to unpack no there's there's a couple things in there that uh that that I think we can go down and you know I got go with the first one here and looking at coming into the cleaning company and you know phone's rain off the hook she says it's chaos and you've got to put in systems I mean it's kind of a two-part question um but the first part is how much did your previous experiences you know being in the military being in you know for in to come in now as a business owner be like oh I've got to you know we got to put in systems you know what was the I guess how much did that experience help you out and then the second part of that would be what would what were the first what was the first system that you built to be able to help them yeah no absolutely so yeah I C Marine Corp like Sops like people die if you don't do the [ \_\_ ] you're supposed to do and we have a system for everything and we train on it like did the same thing going through becoming a foreman becoming a production manager operations manager leadership was all about developing systems that could scale and we could train people on because if it's a system that you can only do it's going to fail it has to be a system that you can teach somebody else to do then that person can teach somebody else to do so all my TR everything I had done prior was it was a perfect fit for the cleaning company was like this is what I do like I've done this at a high level we did over eight figures in annual revenue at the construction company like we went from a a little couple million two three crews to uh over 20 million in annual revenue and 30 crews in a couple hundred employees over that decade and that all came from putting systems in place and then making them scalable then readjusting them as you grow because they break and then refix fixing them and then retraining on them so the first thing when I stepped into that cleaning company is what we had to do is we had to get employee byy it there was a lot of different employees working different times doing different things there was no consistency and everyone of them hated it so one of the first systems we put in was we're just going to a 4-day work week and we work from this time to this time if you're not interested in that I'm sorry you're just not a good fit for where the company's going so we lost about 20% of the staff right there with that move but that other 80% was excited because we just gave them structure and a consistent paycheck and they didn't have to worry about call like calling in and saying am I working this day because then we immediately just changed the calendar and concised it down to that 4 day instead of having everything spread out and we just brought order to the chaos no I love that um so with the people that you lost that that jump ship right away is that what freed up the ability to then make sure that everyone had a full calendar because you only had 80% of the staff to fill 100% of the job no I it really there the work was there it was just structured all wrong where a couple people are like oh I work Tuesdays and Wednesdays or I work Mondays and Thursdays and Fridays and I work from 12 to whatever time like there was no structure so by consolidating it into into one place we actually expanded the cruise we made it we took it from a typical one crew running all the time expanded it into two Crews because you think all phones ringing so now we have some structure to what we're doing we know we have these time slots we can feel we can go out and give quotes fill those spots up and keep the girls working all day every day on that 4day work week and have two Crews actually working so then you immediately double your Revenue so instead of having one crew we then go to having two Crews this is like 30 days into it so 30 days into it we make the adjustment with the calendar and then at the same time roll out another crew that's doing the same thing so 30 days in we were doing double the revenue that was done before just by adding some structure and giving Clarity to the people that were involved that's why that it was that much chaos but think about I mean you you go in businesses all the time this is the thing businesses suffer with is like there's there's just chaos it's just whitew like no one knows exactly what's going on and you can tell the difference when you walk into a well ayed organization and when there's just chaos right the thing that I love about the the systems conversation and and what it allows you to do especially when you've got the proper training in place on top of the systems that you've already built is now it eliminates the need to to hire based on experience you don't need to bring in that skilled Tradesmen to be able to run it because you you don't have the the proper system to train them you've got that built out now you can go and hire for character which is why you got the job right having that skill set the the values the beliefs behind it the the character that that uh was the foundation for who it was that you were that allowed you to step into that role and Excel right so it's incredibly important for a home service company to be able to build that out right away I'm curious with with the scheduling component of it uh like one of the other things that came to mind was was after hour Services that's something that for a lot of technicians tends to be a little bit of a resistance point it's not something that people like doing they don't want to be on call so what's your opinion on that for for companies that are in more of an emergency based service we'll go back to what I did prior in the construction industry and we had on cost Tex like service teex like [ \_\_ ] happens you have to have people to go do that and we came up with a a rotation we were very F like so here's here's some of the part like people don't think you can just be black and white and not be you have to be an ass but no what people really want is they want stuff to be black and white and they just want you to understand who they are and have a great conversation with them so like if you sit down with everybody and you get everything out on the table and you're like here's the deal all customers need us to have 24-hour call because if [ \_\_ ] happens in their house they need to know we're going to be that to take care of them we have to figure out how we can best do this to other like right here like let's figure this out what does this look like and then set up a a a pay structure that is highly rewarded to the people that want to be involved with that because the customers you take care of on the 24hour cars are going to be forever your custom like you show up and you dig somebody out of a [ \_\_ ] show at their house at 2: a.m. that customer would never call anybody else they will only talk about that time when you guys showed up at two o'clock in the middle of the night like the marketing you get out of that the word of mouth the loyalty is worth paying a premium to a guy to go out there and take care of it but you have to have some flexibility it can't always be the same person you got to be willing to have some give and take and then let those guys control that calendar because that's what we would do is we would be like here's the calendar people can volunteer for when they want it we need the entire calendar set for every month and you guys can change the only thing that cannot happen is when that phone rings nobody answer it like that is the only thing that can't happen here and we'll Empower you guys and give you guys the opportunity to be able to control that because that's the only way it can be a success is we can we can create the box that it has to live in but then you guys create what that looks like with inside that box and just make sure we'll always there to serve our customer there it's actually um fascinating that you said that because I was thinking about uh a previous industry that I was in that will remain unnamed actually no I haven't mentioned Tony Robin so I'll talk about the passenger elevator industry I mean they had 50 different Tech nians that were in there um but we but soon we I would find out that when I was looking at the at the schedule looking at the guys like they would always be trading some of the guys would just trade their shifts away they wouldn't want the overtime and they would find other people that would continually pick it up now they're going to find when you do that that they're are going to be those people who want to actually take that on who actually want to do that because their life allows for it or they just want to do it or they want to be there or they want the extra money or whatever and so when you give them that that power and that freedom to be able to understand those things that's where that magic can happen for an after hours an on call basis you find that hero yes I used to call like the person that wants to be that hero that wants to come in there and save that situation you have the same thing with like foreman and project superintendence that they want to be that Hero on the project and if you can paare them with the right project you hit a grand slam because some projects do D they just need a hero that customer needs somebody that's going to be a hero for them and that's what you need in an on call is somebody that just gets their high from going and just this Serv this level of service in a stress for situation where they step in and they just fix it and the homeowner is so so happy about it and over the top and then that typically leads to great reviews and then it gets talked about around the company like those people are within your company you just have to put them in a position where like you just said is like they can rise into that because people don't want to be put into it because that same person if you were like man you're fantastic do car the on car you should do it and we'll get you set up for Success they're gonna be like ah no like because they don't want to be volunteered for it they want to volunteer for it and and not everybody wants to be the hero too and that's also okay and understand that I was actually just talking with our leadership team earlier today and we're planning out our next 90-day rocks and one of the things that came up is there's some team members that just don't want to be leaders they don't want to be the hero they don't want to take that extra weight and the responsibility they want to show up they want to do the job they want to leave and they want to go home and that's okay TR trin's the best business book that was ever written oh oh entrepreneurs operating system we're running on it you know we put it in uh coming up a year I think in like November December and it's it's been phenomenal oh it's unbelievable are you guys running on on us too yeah oh absolutely I mean it's it's been the Catalyst for a couple different Ventures that I've been involved with where we would have never got to where we would going without implementing traction because it it just it brought Clarity around everything that we already knew so I don't care if you're like just starting out or doing 50 million in value tracin is worth the read because it will bring so much Clarity around stuff you already know and stuff you already do it'll just make it so much more clear on like how much more of a tighter ship can be run and account like that accountability piece is is massive um behind EOS and and and actually let's let's pivot and talk a little bit about accountability inside of an organization because while you're on EOS and this is what I love about our podcast is that there's no set questions we just go um and looking at putting in so if somebody were to because we put it in after the fact like we put it in almost a year ago we actually tried self implementing it uh it went great for like the first month or two and then and then a year and a half later hey let's try it again but we hired an implementor this time and it was the best thing that we've the best investment we've made for Eos when you look at putting in um if you've come from an organization you can even use the the the cleaning company for an example you went from no accountability to all of a sudden accountability how can you instill that into an organization where there was none what are some of the the the roadblocks or the the people hindrances that you got to be be mindful of when you do that so I I won't use the cleaning company because I think that's like a a toss up easy because like we I was the new ownership so there was no no past no thoughts of what like I came in and I performed and I showed up and like I said we were gonna do this and we did it like that made it easier like not that it not that it was easy but when you're stepping up for a fresh like it's a fresh set of downs here like you're not fourth and long like a lot of companies like that's like in the construction industry when we started looking at using traction and researching that is we were in a completely different space where we had implemented all kinds of different things and tried to Raw stuff out and could not get any traction with it or it would fall off so it was like how can we figure this out like how and we knew like we're GNA do the we're gon to do the big launch we're gonna roll this out and everybody's going to be like well we're just C we're C 12 months from now and we were fully committed as a leadership team we came together and we committed that we were going to do this for 12 months like every week we were literally going to meet and go over the EOS system the book where are we at what are all rocks what exactly are we doing and we're like we're not going to quit like we are going to do it for a year and we'll see where we're at and we did it for a year and you know a year later we had a lot more traction with it but we still hadn't won everybody over because you still have the naysayers like you build up this reputation over time as a business owner a leadership team and people just don't believe it like it it just seems like oh yeah that sounds all great if we get there but you have to be willing to commit so then we committed to another 12 months and continued and things started get a lot better you see profits start to go up so then you can take that money and reinvest it into the employees and do the stuff that you've always said you were going to do so see that's employees can be jaded because we've said we're going to do so much and then we don't do it and then when we Implement something like an EOS system is if you're looking at it from the outside is all they're seeing is oh here we go they got your other here's another thing we're rolling out that's supposed to make our life a lot better but at the end of the day it typically makes our jobs suck more so you you have to be committed to every outcome that you're going to create from that and then when you do that now people get the Buy in because at the end of the day when you have that um the ability to I mean a players want structure they want uh accountability they want to be measured they want to perform against those measurements and when you have an organization full of b or even C players they don't give a [ \_\_ ] they don't want that they want to hide in a corner because that's what a b player and a c player does but a players they already know they're going to get their [ \_\_ ] done and they're just going to hit it yeah and see that's the thing is that it's such a misconcep that people don't want accountability like I want accountability myself I hold myself accountable most people that are high performers do that so it's it's such a misconception that in business that your high performers don't want that they do they want to know what the target is and what they're going to be held accountable to because most of them want to go over that like they're like all right you just set the Baseline let's see what I can really do because now they know like this is what they expect me to do and like I said earlier like it's it's okay to just be black and white about stuff we have to understand the people we're talking to like that's our all responsibility as Leaders to be that like that was one of my biggest aha moments through my entire dealers I am a high d personality and a lot of people will tell you you got to stay away from that you can't lean into it and that was some of the biggest mistakes I ever made because guy people didn't they didn't relate to that they didn't feel the realness of who Ron really was they knew who Ron was a lot of these guys spent time out in the field with me they knew who I was and for me to sit down and be somebody else and try to have these conversations because that is what was expected of me was wrong as soon as I realized it's what people want is they just want Ron to be Ron but they want me to understand who they are and how do they talk to me so understanding their personalities understanding how we can feed into that and have a better conversation but still be black and white be Ron let them know like hey here's what we expect here's the game plan this is what the trajectory looks like and if you're not hitting that you're not hitting that like they want to hear that but you it's all responsibility to deliver it in a way that they can accept it and I think that's where that starts to get Mucky and people start to think it's oh you can't be intense you can't be this and because people don't know how to handle that well as a leader it's up for us it's it's for us to understand them enough so they can understand it because if we change they immediately understand like they're like this dude's not real this dude's full [ \_\_ ] but if we stay ourselves and pivot our not it's not even a delivery it's just pivoting how they receive information in a way they can because I understood my first time I ever did my dis assessment I was like everybody should read this like the warded would be a better place if everybody read this and understand who Ron newsp was and that was wrong what I needed to do was read everybody's dis assessment around me and understand them because I'm different than 99% of the people in the worded and we all are no matter what personality is you're different than everybody and it's up to us to learn how to communicate with them in a way that they understand it but still be true to who we are you feel that's a natural uh tendency to step out of that authenticity when you're first becoming a leader because I think that's something that's really common I think it's something that we're coached into a lot when you when you start to become a leader and you start to to move into that it's always like well you should do this different or you should do that different this is how we do it it's never like this is how we have to do it I need to you to find the most authentic way for you to do this like we don't Co we don't develop leaders in that way where we're letting people be who they are and directing the outcomes that need to be created because that's all we do like that's all the end goal is to create an outcome and you have to get that person in a position where they can do that and if they're going to lead people if you're putting people in charge of other people you have to let them be them they're not going to be you and I think that's probably where a lot of it comes in is that guys try to reproduce their s into the other leaders when they don't even probably understand their s by uh good enough anyhow on the flip side of that though as as somebody who is a new leader and you look up to somebody else and you try to imitate that person what are some of the I guess walk us through that because there's some good things and there's there's some bad things by doing that yeah I think leadership so leadership I love this subject and we don't I don't talk about it enough these days like I'm out of this realm of leadership but it fact I think leadership is like a living organ like you're either consistently getting better at leadership ship or you're getting worse like it's it's just like going to the gym like you're either working on it or you're not and if you're looking around the people around you and say you're you're get you're becoming a new leader what blows my mind is we have the tendency to take to go learn from the people that 30 days prior we didn't have a whole lot good to say about but now we moved up and now we're going to be like there's this power trip that you have to teach people to overcome like this isn't about power like this is about literally creating outcomes like that's what leadership is it's not about that your seniority seniority to everybody here so going and copying other people Free Wily nearly is a problem what we have to do is we have to look at what terroristic for one you well who are they as a person how close are we aligned because two to all three of us not even two different people all three of us could get up have a one-on-one meeting with an employee to deliver the same message and it it would come across completely different out of all of us how how much of alignment do I have with that person from a perspective of Personality because if you're two completely different personalities see that's one of the traps I fell into is I'm taking leadership advice from somebody that's a different personality than me that of course they're going to do it completely opposite like wrong wrong narrative there like so when I say continued education is what there is so many great leadership books out there we have to continue to educate ourselves and then evaluate the situation that we're in and who's around us and take the stuff that will work best for us in all personalities to achieve the goals that we're trying to achieve I that's what gets lost in leadership like you become a manager you become a foreman like you lose sight that still your job is to create an outcome it's to achieve something but now you get the opportunity to have people help you do that instead of you just trying to do it by yourself for whatever your job was Prior you now have people that get to help you create that outcome and that's where we should be moving towards we shouldn't be moving where I feel like the team should move we should be moving towards our objective all the time I like leadership is an organ part um that's and then I'll pass it to you Evan uh I'm not I don't have a question on just leadership is an organ U because you either you adapt your leadership style to the the changing tides of your organization or whatever season you're in I did a Facebook post earlier today of like business has Seasons could be stormy could be sunny it's how you navigate the stormy Seasons let you enjoy the sunshine and like in different times are going to require different leadership style need to learn grow and adapt so um I really like that part so um Evan what are you gonna ask well it's leadership is one of those things that gets pushed to the back burner when it comes to the trades you know a lot of contractors they they come into it as an owner not having run a team before or they were a service manager but they didn't even have great leaders in their organization because again it's it's the trades it's not talked about a lot right there's so many different hats that you're wearing as an owner of a of a construction company an HVAC company plumbing company I don't care what it is there's so many different hats that you have to wear you're trying to worry about getting the phone to ring and then you need to make sure your Tex are selling and you need to make sure running the calls right and you're asking for reviews after and did they wear their booties did they not wear their booties and there's all these different things and then oh by the way don't forget your p&l statements don't forget to pay your taxes right and and Leadership just gets pushed down so far and yet it's one of those skills it's a mother skill of actual growth you're never going to evolve into the the type of business that you want to run if you don't become more yourself and you need to continue to study it and you need to to adap adapt to it and grow with it like you said it's a living organ so um fantastic points there I know we want to get into our random question generator it's one of our favorite parts of the show where it has nothing to do with anything we've been talking about whatsoever uh you do not get to know what the questions are leading into it uh so you get to choose whether you would like question one two or three we just go with one one Dad do you have one pulled up yeah I got them uh they weren't in our the show note so I I used the ones from our last episode because we didn't ask it because we didn't have didn't get a chance so uh if you wanted it's actually funny when I read them L this would be the great question that I want to ask anyway so if you were stred on a on a deserted island what three items would you want with you and I can't pick an item to get off right what's that I can't pick an item to get off the island correct I mean it's your answer but I would say correct and you can't say volleyball because they already made a movie about that yeah so I would pick my wife my son in an unlimited supply of water very interesting answer so I'm I'm curious as to why well I mean it wouldn't it be any fun being out in the middle of the ocean without my wife and my son and you got to have water you can't drink the ocean water because chances are if we had an unlimited Supply a good water we'd be able to kill enough stuff to live well that is a very good answer um I mean I don't know if I'd want to subject subject my wife and my kids uh to being on that island they're like hey can I send my kids there and I can leave uh only 20% of the time I like that so um one of the things that um you mentioned in terms of of Builder commoms and building that and I want to kind of unpack some of that that part of things and you mentioned the the that you don't understand or didn't you you're trying your best to understand software yourself and this is why you wanted to build Builder commoms to a way that is so simplistic that anybody can use it you reference Facebook well Facebook generally isn't built for the younger generation it's built for the older generation like maybe in the beginning times it was but now when they they the way that they do things is built for people that are new to the platform new to technology new to be able to do those things when going through the technological build of Builder commoms where and obviously at some of the other softwares that are out there what are what is one thing that you think a software company does incorrectly you can't use the Simplicity part when building yeah when building a software yeah they don't say no like I literally got good at telling my developer no because they just want to build build build they like they get to we should do this we should do that if we do this and it's just like no just say no like stick to what it is you want to build and just make it simple because nothing against software development companies or developers or all of that because they're trying to make something great but the way they go about it is by over complicating and making it too big so it loses its greatness it loses that magic because no one said No at some point time everybody was like yeah that will make this so much better but for the enduser it doesn't it makes it more complicated and then it becomes something they can't even use so I just learned to say no and I think everybody that has a software company anybody that's listening to this that's in software should go back and revaluate what have I said yes to that I should have said no to and in the future as you lay out that product Road mapap and develop stuff say no more to the stuff that spins out of what you're actually trying to build and I and I don't think that's just applicable to software companies that's applicable to every company um especially when you get something like an EOS system in there where you're you're dreaming and scheming on things and building out ideas and having those those parts of the like don't get me wrong dreaming and screaming Dre dreaming and scheming plus Visionary work is imperative to an organization's survival but just because it's a good idea uh or just because you think it's a good idea now doesn't necessarily mean it is a great idea right now could be something to road map later yeah it's listen to your customers like in business like we all have our core if you're an HVAC company you probably do HVAC Electrical Plumbing like those are your core things like you're not going to spin up something completely CRA you should it not that you're not going to people do it all the time shouldn't spin up something completely crazy but that's what ends up happening it's people think oh well I can do that and that happens way too often in software because the barrier to entry is a lot less like for me to be able to go spin up a CRM and a scheduling software and a finance software with Builder coms would it be super hard but like we would suck at everything except for the communication piece and like to me that's not worth it like let's just do what we committed to do and just do it be the best around at it well it it does back to the services like I know you mentioned a doing plumbing and electrical as well you have to get a new license or you need to bring someone in who has the license and now you're relying on them to stay with your company in order to keep it you're bringing on an entirely new service line where you don't have any systems so now you got to rebuild out all of that you got to redo your price book like there's so much that is involved with bringing in a new service line and it's so enticing because when you're changing out that AC it's like I could add in a water heater that's no big deal right but stepping out of your your area of genius and what it is that you're it the best at I mean we had Tommy Melo on on Monday and I know he's been on your show as well correct yeah I think while ago yeah um someone was in garage doors and he said on the show he's like if I add in a new service line I could add 30% Revenue to my business instantly just by doing that but he still hasn't done it yet why because there's still room for improvement in the vertical he's in he can still get better at it and he can still produce more results out of it he hasn't squeezed every last drop out of it yet so it's it's in jumping into another service line before you're ready is uh I think a huge huge issue that we see across the trades and it ends up distracting you from what it is that is your primary source well it's just a lot harder than what any body thinks it is I mean we I went we went down this road where we because for permitting reasons like we needed a master electrician we needed a master plumber and originally we subbed it all out and then it was like we're big enough we should try to bring this in house I spent two years of my life trying to bring this in house in every master electrician every Master plumer every journeyman we it's just a it was a different machine and all we were trying to do was try to make something work that were literally two gears that shouldn't be by each other they just didn't work and how it ended up H the best way we could make it happen was to go out and acquire an electric and plumbing companies separately keep them separate entities but just feed all work to them under the same umbrella and that's because they're their own machines like right it's just a different word I don't think we think about that when we're like we're going to add a service on that's what people with the cleaning company people wanted us to do all the time we were very strict to what we do if you get to know me at all like we just do what we do and I'm good with saying no like we did resider re or residential reoccurring cleaning we didn't do onetime cleans we didn't do Airbnb cleans we didn't do commercial cleans we weren't going to come clean up after your birthday party if you wanted to do business with us you were going to be a weekly monthly bi-weekly customer of ours and if that's not what you were looking for you know what there is a ton of cleaning companies that just want to show up and randomly clean your house I wanted consistency I wanted predictable revenue and that's the only way to do it love it well which leads us into Builder comps uh so want to make sure that we we give you the full opportunity to to promote that talk about that uh it's a phenomenal software that allows that full communication from the customer all the way through the Journey of of moving through a renovation so why don't you go ahead and talk to us a little bit about Builder commoms the solutions that it solves and then uh we'll tell people where they can go and go and check it out yeah absolutely so you know I we sponsored the local golf tournament about six months ago and I'm standing on the hole there and this Builder comes up and he's like I wish I knew about you 45 minutes ago and I'm like what are you talking about and he's like I literally just sat in my truck for an hour and a half going through all my emails trying to figure out what light socket this customer wanted so I could tell the guy at the job site to put him in and he's like if I had your software I would have probably known about that in two minutes because he saw as he pulled up he looked up our software and he's like I would have immediately been able to know and he said what would have even been better is that my guy could have just looked and all the would have been there in one place and that's what Builder coms does is it gets all this information that's spread all over the place when you think your emails employees text messages all the documents on your desk the phones for photos we get it in one place and we simply organize it per project so when you click on that project you know what's being said in all the different messaging Channel you can see what updates are there from the pictures of who's been there and done what what has been proposed what has been signed off on simply in one place and where the magic really happens and why I built this software is I touched on it at the beginning is that air traffic control it's that channers of communication and what that does is when that customer has a scheduling question and they reach out they're actually talking to the person that's in charge of that schedule they're not talking to the sage rep they're not talking to the receptionist they're talking to the person that can answer their questions and in construction the problem is is that the customer is never talking to the right person in our industry standard is hey sorry I'm not the guy well I got tired of not being the guy and I built the solution so that customer never has to hear that ever again and if they have a Sor question they're talking to the Sor person and then we create a datab base of all this communication throughout your company and for anybody that knows what's going on with AI and everything out there like what we're going to do in 2025 with that information that people are collecting now and that data that we're going to have for these companies is absolutely going to blow people's minds it's going to blow up what communication forever looks like uh and that's what we're out to do is I'm out my commitment is to fix communication once and for all in this home service in construction industry it's too long been the elephant in the room and we're going to do away with that I love it simplifying communication so that you can provide an exceptional customer experience did he buy the product right then and there on the golf course yeah yeah signed up he signed up right before he even better I saw I got on your site and was like I literally was F I told tell everybody I said you should spend the rest of I was on like ho two I was like you got 16 more hoes to tell everybody what you just told me because that is the pain like that's the pain Point yep it's pain point for a lot of businesses it's the in organization of of data and and especially when you're dealing with customer focused customer forward things and change orders this change orders that build this add this change this tweak this whatever I mean I went through a kitchen Rena I know what it's like um um so they probably were TI they probably glad that that my job was done but uh so if you want to find out a little bit more about Builder commoms you can hit them up build bus.com it is C Ms not 2m just one M builder.com we of course put these in the show notes for after on facebook.com Ron wesley. newsbomb and then if you want to check out the episode that he did with Evan hit it up you youtube.be YouTube's such so weird like that like why don't you go youtube.com [ \_\_ ] YouTube uh look up construction Champions on YouTube there you go uh there you go so uh perfect well thank you for taking the time uh Ron to come on the show with us here today and have a great phenomenal conversation I'm glad we end up hitting a hot button in terms of talking about leadership I know it's always something that I think just gets missed a lot um in a lot of everyday conversations so thank you for talking about that but before we do wrap up we have one final question here for you Ron all right and that is what is one question that you wish people would ask you more but don't uh I would say why did I start why did I join the Marine Corp so why did you join the Marine Corps so uh it was a calling I had a tattoo on my neck I spent 13 months getting that tattoo removed to go to the Marine cor like it literally I was 22 and I needed to know if I could check that box uh I didn't want to spend the rest of my life and I went to the recruiter and the recruiter said I'll never be a marine because of the tattoo and 13 months later I stood at Paris Island on the yellow Footprints and I blew their minds uh that I was willing to do that to go and it was it was what I was meant to do we wouldn't be having this conversation today if I didn't make that decision right well on every decision that we make in the moment we don't know what the outcome is going to eventually be right all we do is the choice in the moment own that choice in the moment and so you own that choice and thank you for that that's yeah super cool story and to get a tattoo removed uh I mean around the neck I mean I have one lone tattoo on the inside of my foot and it hurt like a [ \_\_ ] and it was a one of the bamboo tattoos so I can only imagine the process of getting it on the neck and then getting it removed because I can't imagine that felt good either I got quite a few tattoos getting one removes the most painful thing I've ever done in my entire life yeah I can imagine I can imagine Soh so your neck that skin is not thick yeah it wasn't positive yeah so well thank you for doing that and thank you for taking the time out of your day to S and chat with us thank you guys for having me I enjoyed the conversation hey you're very welcome and until next time cheers well that's a wrap on another episode of hva success Secrets Revealed before you go two quick things first off join our Facebook group facebook.com SLG groups slhv revealed the other thing if you took one tiny bit of information out of the show no matter how big no matter how small all we ask is for you to introduce this to one person in your contacts list that's it that's all one person so they too can unleash the ultimate HVAC business until next time cheers"

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"VideoID": "912",

"Title": "How Construction Costs, Labor Challenges, and AI Innovations Are Shaping Real Estate",

"URL": "https://www.youtube.com/watch?v=OzP5e3IBPhY",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] welcome to surgeon Syndicate if you're paying attention you know that you only make money when you work it might be great money but it's dependent on you the information on this podcast will help you solve that we interview experts and provide analysis into Financial Freedom through commercial real estate why to help Physicians like you thrive let's dive [Music] in welcome to Syndicate this is your host Dr Michael mcmanis thank you for joining us for another episode today for those of you watching on YouTube uh trying to think there's a whole lot there um but we've been talking a little bit about some of my uh things going on in this whole eye surgery so you can see that uh that that eye is not quite open yet but um that's not going to keep us from charging forward uh so today what I'm we're going to be talking about what's changing in construction cost here in the middle of 2024 um a lot of this I'm going to give a shout out to Hixon architecture was somebody who I follow on uh LinkedIn because they have these great reports uh kind of of what's going on in the construction business and why is this important well you know as we're looking at a lot of things going on in commercial real estate today construction costs are still a huge part um there's a lot of talk about interest rates and such but a lot of deals right now really have a hard time uh working because of fluctuations in construction cost you know as we all know that uh construction costs really shot up during the the pandemic but we're starting to see now as material pric stabilizing but they're stabilizing at significantly higher prices and in most cases the supply chain recoveries in full swing uh with lead times returning to near historical Norms but there's still some outliers here and we'll get into this uh a bit more down in this report uh contractors backlogs again this can affect cost because if contractors have long backlogs they can afford to charge higher prices um if they're scrambling more for work we'll see lower prices uh they especially in the industrial and Manufacturing sector contractors have remained busy and things like computer chicks chips Electronics high-tech electrical manufacturing data centers logistical centers which we talked about recent here recently here in Utah and fulfillment uh type facilities which are really your last leg distribution centers um and this I wasn't aware of there's actually a lot of infrastructure projects going on that has really seen some exceptional growth these so-called Mega projects that a lot of of these are being driven on large part by Congressional funding acts um so there's one that I didn't know about that this was was something new that was going on um and here's the other uh Supply chains got significantly worth for large electrical equipment because of this this is such things as large Transformers switch gear and generators uh it appears there's some lead times on the magnitude of 1 to 2 years years for some of these items um the other big concern right now is cost of Labor as there has been some changes going on here and it all has to do with the unemployment rate and how competitive the labor market is so um a lot of private projects are still looking at um concern about the federal funds rate there's a lot of talk about this we talked about it recently the FED has really been pointing towards that they're they're looking to to start cutting rates how fast and how far is still a big question and does this mean that maybe we're just looking to see slightly lower rates in the near future or will there be significant changes uh nobody really knows so um diving into the rest of this issue we're going to talk a bit about us construction costs uh some of the leading indicators in the construction industry construction spending backlog indicators and again back to employment cuz this has uh a big imp a big impact on construction labor um then we'll get into some of the the components of uh heavy industrial Manu um construction so the Fed rate pivot federal funds rate has been at a 22e high in the 5.25 to 5.5 range you know that's interesting for me to hear because it sounds like a long time and this is dating back close to the turn of the century um I I'm still one of those guys who feel like really since uh since 2000 a little before we've seen artificially suppressed rates uh and the question is am I wrong are we going to just be in a lower rate environment overall here and rates will come back to things that previously were considered to be uh astounding lows or will we stay uh more in this uh in this range we've been in that's what we're going to find out over the next few months when we see what the FED does um what does that have to do when we're looking at bigger projects and whether people are building new projects a lot of these are are dependent on where they can Finance them the other thing that falls in with with financing is our banks ready to lend part of the you know the the cut back in in in building is not just been that rates are higher but also banks have been less willing to lend making it harder to get um to get lending for these bigger projects so uh let's go on here now to labor costs and labor shortages the industry labor shortages to meet demand have been the most pressing issue for most construction uh companies around the country in the last few years uh it's welcomed by the workers to see Rising wages and abundant work opportunities but construction inflation has shifted away from material towards the labor component of cost due to increasing retirements from aging construction Workforce coupled with reduced interest from younger Generations there's continued strain now this is really interesting because you know I have kids in my who are just pushing 20 years old and is as they're heading off to college you they're they're they're talking to kids and I see these things come from colleges they're like uh you know our average graduate makes I've never seen one over $55,000 a year so it's usually somewhere between 50 and $555,000 a year and they're promoting this but at the same time I see Billboards uh promoted looking for to bring in Apprentice electricians and hfac workers where they start at over $70,000 a year and many push up towards $100,000 a year uh after they complete like six months of training uh so you can have a kid who's not even 19 years old pushing towards making six figures while uh his peers are off at College putting away you know $100,000 or more in educational debt uh to come out and get a job that makes $50,000 a year um now when you when you do the research I know this is one of my favorite topics because it's always been promoted that you see these things that say college education increases x amount over a a worker's Lifetime and the number had always been like a million dollars you know but you you see this but very few times will you see somebody go into deeper uh deeper dive on this because if you take out the highest earners who require a college education and that's the doctors lawyers Architects the highest paid professionals that that number even historically went to where there was really not a lot of difference and in the labor market we're in today especially when you look at the trades that is completely getting blown out of the water um and this is man there's a a great opportunity here especially I've met some young guys who are working on the trades and they're also becoming investors and becoming Real Estate Investors and they're kind of got this inside eye on what's going on and so they're making great money they're starting to invest young they're beginning to own own properties these kids are going to be hard to catch by the kids coming out of college um but anyway so there's my little sidelight on the uh you know escalating labor costs and the construction um this is still having an impact on trying to get projects done because construction costs are High um these will continue to probably stay high until we see a Slowdown in building if we get a if we get some sort of recession um so moving on what's going on with the government so we got the chips act um the IR a inflation reduction Act and the infastructure investment in jobs act so according to deoe public investments in non-residential sectors facilitated by these acts offer job opportunities however the increased demand and related construction sectors is creating some challenges such as restricted labor resources uh that aren't keeping up with demand along with persistent struggle and long lead times for large electrical equipment like Transformers and switch gear um another big things is going affect this is generative AI engineering and construction firms and construction technology companies are actively researching the capabilities of generative AI to improve efficiencies and are also exploring solutions to leverage this technology for their specific business requirements um you know we we have some shows a while back uh with Vanessa Alfaro and she came on and talked a lot about Ai and she's really been big in this in this area you know one of the the big areas of opportunity in in generative AI is not out there developing actual AI doing the programming doing the technical part but it's going to be the adaptation of it into industry and Consulting to help companies and individuals uh learn to use this and keep up because people who aren't using it are going to fall behind and the rate at which it's improving is extraordinary so it's interesting to see this is the first time that I've seen this really in this kind of uh nuts and bolts area of construction that they're starting to look to where they can use generative Ai and it's going to be disruptive in the job market a lot of jobs um especially if people are doing redundant work um are going to go away they're going to be taken over by AI but on the other side it's going to create whole new jobs and the people who get in front of this are likely to do very well uh so Moving On Us construction costs continue to hold steady at significantly higher than they were pre pandemic but we're seeing some of that that that rate of Rise stabilize a little bit January 2024 the construction cost index as reported by engineering News Record is 2.6% the building cost index is 3.8% and material cost index is 4.5% so we're still seeing that materials um are a big part of this this rising cost um cities with the highest construction cost increases were Chicago and Los Angeles at the top followed by Cincinnati Denver and Pittsburgh um you after spending the last decade in the midwest you know it's a little bit of smile on my face to see the Midwest doing well with Cincinnati and pit Pittsburgh in there because if they're seeing increases in construction cost that means their economies are doing well and there's some great things especially going on in Northern Ohio um right now so some of the the leading indicators of the construction indust uh industry uh these are showing mixed signs of slowing which may be offset by projects coming down the line as a result of congressional funding acts so some of the indicators here a key one is architecture buildings or what are architecture billing firms architecture firms uh billing out which kind of shows new new programs or sorry new projects in the pipeline line um right now it's a bit below average indicating a Slowdown in Billings which can be an indicator of decrease in projects um coming here in the next months to year total construction spending though is still 11% higher and private construction spending is 10% higher than a year ago according to US Census Bureau the total construction spending for November 2023 um it's still 11% higher than a year ago look at construction backlog or the construction backlog indicator uh has been up on a monthly basis but is down on a yearly basis so again we're getting some mixed signals here that we're not really sure about construction employment continues to gain jobs while construction unemployment is at 4.4% a tight construction labor market can continues to create issues of finding enough construction workers toal total construction employment had gained a jobs through the end of last year uh Total Building construction employment and Specialty trade contractors uh continue to show growth and in uh in construction employment although this appears by some of the indicators to possibly be slowing down um construction labor TOS though continue to rise especially in major metropolitan areas and specifically for the more skilled labor in the construction trades um material inflation as we talked about a little bit earlier this has started to come down from its peak uh some of this has just been a a stabilization of price so inflation is coming down but doesn't mean prices are coming down prices are just starting to stabilize um asphalt prices actually took a dip here in the last 12 months those are stabilizing again uh concrete pricing though continues to rise while reinforced steel prices show a decline as of December 2023 Ready miix Concrete prices are still up from a year ago if anybody out there has been trying to build anything concrete prices have really just been a deal killer some s especially if it's a project that requires uh a large amount of concrete uh structural steel pricing uh the price of steel has begun to cool uh this is good news for people looking to any construction prices of any size and we were trying to do our uh office in ASC project uh a couple years ago steel prices were one of the biggest things that were so in unpredictable and we going up so so fast that it made it really hard uh to price out the project that every stage where we reached the end of it and we repriced it um steel prices ended up killing the addition because it it just made it unaffordable so this is good news for for people looking at uh projects that are going to require um that require structural steel and finally in our riew piping prices uh looking at all the different types of I think digging into the details of piping is probably beyond the uh the the scope of this of this podcast but still across the board seeing an increase in the price of all types of piping corrugated steel looks like it's up the most um but across the board that's still having an impact on new projects so what is this mean for commercial real estate as a whole well it means that new projects are still expensive and is still um can be tough to get projects done uh we had a recent discussion about Sal about uh industrial building here in Salt Lake City and that's really between you know land prices skyrocketed during the during the pandemic and construction prices have gone up although there's huge demand a lot of projects are still really really tight as to whether they can pencil out and get done um what does that mean for us as investors there's there's a lot going on in the industrial investing market right now it's kind of become the the new hot thing I've seen on a lot of the uh at least a couple of the crowd sourcing or crowdfunding PL platforms out there for commercial real estate and and I and I heard recently that for one of these the number one uh group group that is investing on these platforms are doctors um these were platforms that when when I started my real estate investing Journey uh was all multifam and it was really where I started investing the reason I started investing there was kind of this you know the risk benefit ratio of I wanted to get in the game I needed to start investing because until I did it it didn't sink in for me the learning wasn't the same uh not being in the game is in the game and and there were a lot of multif family projects that were promoted as being absolutely incredible um but they had low uh entry points so you know you could invest $220,000 where with a lot of the bigger private uh developers you know they're looking for $100,000 Investments I I invested in a good half dozen through there and and a significant portion of those uh were were people who were new to uh multif family and kind of came from some other places and uh out of those looking back uh working through some tax stuff um most of them have still paused their their prefs uh the number of capital calls has continued to increase I didn't see many for the first um couple years as as things started to change with higher interest rates but I I've seen more Capital calls now so I you know I I guess got a mixed impression of these platforms these platforms are rushing to Industrial real estate now I see the emails all the time they got all these uh industrial deals and you know it just kind of makes me wonder I I love industrial real estate but right now it's the it's the Hot Topic and uh you know there's there's probably a lot more value investing in multifam right now because prices have changed so that's what I guess I just say you know when when you're looking at these types of deals um ask ask the tough questions um the tough questions will be uh one on financing and and what are they planning on doing with their financing because most industrial deals get signed to long-term leases meaning five years is a short lease 10 to 20 years is a long lease um and and I think the the really reputable sponsors here should be doing financing in at least in the same ranges the leases you so if they're doing short-term financing and right now you're going to see more people bragging about long-term financing is what they're hoping to do is refinance at lower rates anticipating rates coming down um so there's something going on with the with the industrial world we look at construction across the board construction prices are still High um and that means that people are going to make new construction worker a lot of the uh really The Experience Pros it's not an easy place to make things work now so if you're looking at investing in something that's new construction uh ask hard questions and and maybe ask them also like what are the things that you're not asking when it when it comes to uh industrial real estate the things we talked about here are important big ones here being what's going on with their labor cost how have their labor costs been changing um how long have their employees been with them if it's a company with a lot of turnover they're going to see a lot bigger impact By changes in labor costs and somebody who have long long-term employees and and often what happens with long-term employees is they may not have to keep up with with every fluctuation in the labor market because if they really treat their employees well and they make it a great place to work their employees aren't shopping around as much and they're going to have more stable costs over time um ask them about their uh if it's a bigger project their big electrical equipment since that's one that still has has long lead times if they've got their orders in what they expect and if they if they don't speak of there being any issues with that that's a good point to ask more questions and ask them if they've already got that stuff ordered or delivered um because that's really about the only way to make sure you don't run into issues with that is if you already have it on hand um the other things we talked about today um prices big one being concrete concrete's one that still hasn't come down so if it's a project that requires a lot of concrete inquire about their concrete pricing and is that pricing locked in or there's still some variability for them there so I hope this has been a IAL for you and thank you for joining us here on surgeon Syndicate please join us for our next episode and we'll see you then do you care about paying too much in taxes and would you like to save more of your hard-earned dollars here's what we found we found that most Financial professionals have a one-size fits-all solution so the question is would it make it easier for you to have someone tailor your tax Solutions to your individual needs so you can keep more of your money and do what you want with it that is exactly what we do at excelra as surgeons we know the difference between routine surgery versus lifethreatening interventions and I want you to know that I've used unisia and her team for my personal financial intervention and I love the results I would do you a disservice if I didn't recommend them to you we'd love to help you so let's jump on a call and see how we can collaborate simp go to www.excel.com mcmanis and book your free call today this has been an episode of surgeon Syndicate if you got value from this episode you know other surgeons are hungry to become job optional and you can help them by sharing this content today schedule a call and we can make a plan looking forward to having you with me on the next episode [Music]"

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"VideoID": "913",

"Title": "Making Vacuum Water Pump || rajiv construction #construction #mini #scienceproject",

"URL": "https://www.youtube.com/watch?v=2EFIN-p62Q4",

"Keyword": "Commercial electrical construction",

"Transcript": "[Music] [Applause] [Music] a [Music] [Applause] [Music] [Applause] [Music] [Applause] [Applause] [Music] w [Music] oh [Music] [Music] oh [Music] [Music] [Laughter] [Music] [Music] n [Music] n [Music] la [Music] nah [Music]"

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{

"VideoID": "915",

"Title": "Electrical Installation",

"URL": "https://www.youtube.com/watch?v=dDf3A2s9HGI",

"Keyword": "Commercial electrical construction",

"Transcript": "okay welcome back what I want to look at today is electrical installation technology now the knowledge is the same okay and the knowledge remains constant but the unit may have changed okay so be aware of that don't not put too much emphasis on the unit 2 three okay because this may have changed but the electrical insulation technnology that is still relevant okay now I'm not going to read this through to you but what I want to do is to tell you about it and to make you aware of the requirements that you will need to be looking at and considering from the time you start your apprenticeship okay you must have a good understanding of the principles of Industry standards and start to understand how some of these standards are applied and that standard that sets out in the IE regulations okay now while knowing where to retrieve information is important the ability to interpret and apply what you have learned should be developed as part of your core skills the following learning outcomes provide some of the essential building blocks for those core skills now it is irrelevant that you understand this for yourself and that you find your own learning style or your method of learning okay and that is fundamental to you as an individual okay I can show you what how I approach it but you must find a way that it formulates in your mind the shape and the outcome that makes sense to you okay now build me okay a little bit let me just see if I can drop this down one side a little bit so I can get it make sure it it fits into my framework okay yes it does sorry about this BL blur bit here but I hope that that can we can get that in and uh we'll be able to get it up let's see how we do okay and let's see if we can make that clearer by going in there I hoping that it gives me what I want okay P back okay and here we have have some comments of certain things statute a law made the meaning of Statute a law made by Parliament as an act of parliament okay civil law law that deals with disputes between individuals and organizations in which liability is decided and compensation is awarded to the victim okay so all I'm doing here is laying down some foundation for you to make your way of certain circumstances under which you may find yourself at a point in time okay now the law affects our everyday and working lives it it does not participate or negotiate with you as an individual it has no moral standards as the law stands you will comply with the law or else okay and here we have Strat regulation I'm not going to read this for to you I'm hoping that it comes out in the video to make you aware of what it what it means and you can see it for yourself okay let's just go in a bit okay just come up just pan back and again ignore the unit two three okay the information remains constant and confirm this with the i e regulations again and with regards to this type type of booklet okay now I'm not going to read this for to you the aim here is for you to be able to read this for yourself and to extract the information that is relevant to you as a whole and again key key points the e you you are apply to workplaces and not private homes and I'm looking at this point here okay this is what I'm looking at here okay Duty holder key points again look at your key points electricity at work regulations 1989 again make yourself aware of those okay they are essential and here we have the h see the health and safety exective produces a memorandum of guidance okay and this is the random of guidance basically you looking here at regulation 4 to 16 and these are par mount in regards to the electrical electric electric so in regards to the electrician work okay let's make sure you can see that okay okay again I am looking making sure that trying to make sure that you can see view these okay as there okay and try and do the activities as well please okay if you if you can for now I don't need to talk a lot here CU what I'm sh you should do is for you to do the work yourself and to stop and select those points of interest that is interest that is relevant to you as an individual okay okay again not much talking for me is requir from me because you are expected to read this for yourself and to implement it and at your appropriate site okay now make sure you comply with the current ie regulations currently the 18th Edition in this case okay well not in this particular case but um for this period of time in respect of the Year okay so you may well looking forward to the 19th and 20th edition of the IE regs okay to bear that in mind please okay for for for now remember that you're looking for technical information and this is just showing you part of that technical information it shows you the key what the symbols represent on the diagram itself so bear that in mind follow that through for yourselves wiring diagram not for okay again make sure you can comply with the activity let make sure you can see the activity okay and I brought it to a at a different angle okay now you will need to pause this at the places of interest to you okay and there's quite a lot of pages here cover but you're not meant to cover it I can shrink this page into half an hour roughly and that's what I'm trying to do okay shrinking the page into half an hour well Shing all the pages into half an hour okay so you can glance for it at your Ledger make sure the symbol are up to date confirm that with the IE regs at all times please okay that is your responsibility at all point in times for for for now again look at the activity answer the activity please the answers is in text remember you can pause this for for your Ledger okay to specify or to examine anything you wish to closer okay different types of trays have I missed him out one second let me just see if I got see if I've moov angle somewh a okay ni look I'm just looking at that at this here a little bit over my Edge okay but um I'm not going to stress too much on that called the main the main thing that you can see assessment guidance okay this down a little bit sorry but no no no no that's fine I'm going to go with that thank you I'm staying with that size m now here you have different type of saddles okay so bear in mind what you're looking at and be sure that you understand the concept of it okay read the information read read read okay I might have this too large actually let me just check something here I might have this a little bit too large it may not be giving me my text h okay right this is a bit as soon as as soon current flows the conductor temperature will increases the amount of current causing the temperature to reach 70° C is the upper limit to conductors ah okay right we well you improvise these little bits here for me I I got a cut off point here which I did not realize had happened before but you can simulate that for yourselves anyway okay I'm not going to stress too much on that cuz it's only to provide you with a background and so forth okay okay can I got you I got you I got you how I got you let me see if I've got him correct yes I've got it okay yes yes okay it's in it's in frame okay okay good and look at make sure you follow the appropriate methods to for that is applicable okay you've seen something like you've seen this already I've done some calculations on this already previously okay so look back at that this just to make you aware of the relevance of it okay some some of the text are off but the main body of the text framework is there okay okay now prospective current arous amp okay so forth sorry about this one here this is a bit lurry okay so I'm not going to change it though it's only for information so I'm not going to stress too much on that either okay okay still not going to too much on that okay either okay and this is just showing you how how a digital C device works okay operates and just make sure you you can I can bring it into frame for you okay go back mhm M mhm some of these hasn't come up quite good okay but um they will serve a purpose sorry about that again a bit blurred okay from the copying for for [Music] mhm for [Music] water flowing that way okay okay okay and here we have photovoltic technology again some of you will be working on this already it's quite a massive area of work now coming into this area field okay for and here you have the some pumps he in system showing you how it works okay let me just go to this a little bit more okay for for for now here I am not going to again mention anything because you can see requirements for micro renewable energies and that we're talking a lot about that these days here recently okay in 2023 okay okay will go that okay thank you hope you found this useful and please use this as a base of information only okay thank you byebye"

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"VideoID": "919",

"Title": "If only it were that easy. Hope your day went better than this person’s 😫 #fail #construction",

"URL": "https://www.youtube.com/watch?v=EzCfrf32kcE",

"Keyword": "Commercial electrical construction",

"Transcript": "I better go to the p"

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{

"VideoID": "920",

"Title": "Electrical Work Ep.97",

"URL": "https://www.youtube.com/watch?v=VUh\_yHc6C2c",

"Keyword": "Residential electrical construction",

"Transcript": "in my opinion planning the electrical details of a house is different than any other aspect of the build for at least three reasons first is livability the use of electricity in a modern house is the biggest and most constant point of contact with design either good design or bad design now right away of course there are zillions of choices to make about what kind and color and shape of lighting fixtures and deciding which one's going to look best but just be sure you spend at least as much time thinking about and more importantly getting opinions from folks with experience the questions about general lighting versus task lighting switch locations and types outlet locations and types system capacity and expandability and on and on and on this is another moment to watch out for the hey i know let's instinct that causes so much trouble in so many design questions second is the reality of the danger associated with electricity it is by far the biggest and most widespread life safety variable in a house both from the aspect of fire and electrocution third is the challenge of knowing and complying with pages and pages and pages of codes that govern electrical installations these codes hugely complicate the first dynamic i talk about and they exist to guard us against all the threats that i talked about in the second so all three of these realities just have to be accounted for on an electrical drawing that shows the locations of all the parts of the system that must remain accessible the switches outlets panels light fixtures all of it there are of course very specific symbols and abbreviations that are industry standard on plans and anybody can learn them if you do that and then mark up your floor plan with your first blush ideas about the electrical and then sit down with your electrician to talk it over it's going to save everybody a bunch of time a bunch of frustration and probably some money as the actual plan emerges from that conversation [Music] the first task is to scatter and then lay out to perfect locations and nail up the boxes and fixtures that live behind the drywall pay serious attention to this the smallest mistake in height or alignment or how far it projects out of the drywall and into the room or whether or not it is plumb will show up and be obvious for as long as the house stands [Music] also be aware that the inspector is going to be watching for code compliance not accuracy in the appearance aspects of the installation [Music] so just a little more about drilling these holes you probably noticed that this big red drill motor is similar to the one that phil uses now for years a milwaukee whole hog was a standard issue tool for drilling heavy holes like this they have incredible torque they work great but they're a much shorter tool now sometimes that works for you because you can get them into tighter spaces but what it really means is that when your bit hangs up in the cut on a nail or just in a hard bind that whole hog is going to start to spin and with the short handle you just can't stop it lots of folks have been hurt by that great tool these longer drill motors give a guy the extra leverage that you got to have to be able to control all the power that's being discharged at the tip of the bit without breaking a bone with the panels the boxes and the light cans nailed up it's time to start running the wire or roping the job when an electrician is nailing up the boxes and cans he or she is also noticing and thinking about and planning the routes that the wires are going to take to get to those boxes so once the drill comes out most of the holes can be drilled at one [Applause] [Music] shot [Music] [Music] [Music] maybe you can see now why the plumbing just had to be installed before the wiring it would not have been possible for phil to have done his work with the waste and vent system or with the water lines themselves for that matter with the wires already running through these spaces and besides that notice how vulnerable the water pipes are to the work that simon is doing here the corners of these drill bits are sharp and it could easily make a little bitty nick that would damage a pipe perhaps go unnoticed and cause big time damage to the house down the road luckily simon's a pro and even though he's working at speed he's accurate and more importantly he's responsible it's a fact of construction that every trade is vulnerable to the other subcontractors when the hvac guys roll in here next week we're going to be counting on them to be responsible enough to not carelessly injure any of the electrical work or the plumbing that they will have to work around [Music] wire management is a real deal the jacket or the sheath on romex wire is a safety item and it must not be compromised so if your wire develops a bunch of kinks and then you pull those kinks through the holes that you've drilled and you tear or pull back or cut the sheath the jacket on that wire you're going to get called out your job's not going to pass that's a no-no this means you better figure out some way to unroll that spool as needed with no knots or birds nests [Music] foreign [Music] oh [Music] three different wire colors designate different conductor sizes inside the white sheath the wires are 14 gauge the yellow indicates 12 gauge slightly larger and the orange is 10. this reduces the chance for an apprentice to make a mistake and run run the wrong size line to the wrong receptacle and it makes it faster for the inspector to verify code compliance [Music] so as you can see a right angle drill motor with about a 13 16 or maybe a 7 8 inch drill bit is terrific for drilling through the studs and the heavier pieces a cordless drill works great on thinner material make sure the edge of the hole is at least an inch and a quarter away from the edge of the stud or be sure to put on a nail plate to protect the wire now as the wires get pulled into the boxes have a sharpie a felt tip ready and handy to label them correctly while you remember where they came from and where they're going you're going to thank yourself when it's time to make up these switches and the panel if everything is clearly marked [Music] do [Music] foreign [Music] do [Applause] [Music] [Applause] [Music] okay so you probably remember watching me run the power feed up inside the stem wall when i was building the foundation i did that so the three inch conduit that's holding the line from the street coming into the house wouldn't have to be exposed coming right up against the outside of the siding into the bottom of the meter base it's jarring enough to have the meter base right here front and center but like larry would say that's the code and at least recessing it back into the wall cavity is a lot less obtrusive even if it is a lot more effort [Music] that was political [Applause] each breaker in the panel is powering up a different branch circuit and the wire that runs from the panel to the first box is called a home run now the capacity of the breaker both in terms of volts use 120 volt or 240 volt and the amps which usually range from 15 amp to 60 amp breakers as well as the wire size itself is completely dependent on the maximum possible electrical draw that that circuit could possibly experience also different situations different uses need different numbers of wires to be run to and from the locations to make the different functions work switching for example is not even possible if you don't run the right number of conductors to for instance a four-way or a three-way switch on top of this the code calls for details as specific as the spacing and the sizes of the staples that you use to hold the wires in place there are lots and lots of bright ideas that are just not possible because of code requirements one of the hallmarks of a good electrician is the work is tidy the wires are flat the holes are square the wires are parallel the bends are even and crisp and nowhere is this more true and important than in making up the panel attention to appearance seems to almost always indicate attention to the other more urgent items that are so critical to long-term function and safety [Music] do [Music] we decided to use a 200 amp main panel with the 200 amp sub panel located in the center of the house now since we have natural gas here in the house the maximum electrical draw is greatly reduced and because we will need a lot of space for individual breakers and because the main panel is clear out here on the very front corner of the whole deal it made a lot more sense to go with two smaller panels rather than a single 400 amp main panel thank you for watching essential craftsman and keep up the good work"

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"VideoID": "921",

"Title": "How much does it cost to wire a house (New Construction - Electrician)",

"URL": "https://www.youtube.com/watch?v=3Doe4MxUkTQ",

"Keyword": "Residential electrical construction",

"Transcript": "hello and welcome in today's episode we're going to talk about the electrician price - how much it was to wire this little house of 720 square feet so let's get to the point right to the point and that price was 50 100 bucks so what does that price actually include so as I'm spinning here and showing you all the wires and connections by the way this is day one and I'll show you here the next day and then some bonus footage towards the end of the video so that price of 50 100 bucks X includes everything from setting the temporary pole for temporary power right when you start construction and then it also includes all the final trim out the final job basically when it comes to finishing the house so all the receptacles all the breakers all the wires the fork and lights are included and prop in that price I have to buy my own fans and I have to buy my own lights for the vanities in the bathrooms but other than that all the wires like here everything is included so the total job is basically from start to finish is included for 50 100 bucks so that how much that's how much it is and that job as you can see here it's kind of messy on the first day in construction everything really honestly is but you'll see that the guys do clean up after themselves after they're done and this electrician is very very good at what he does and he's a cool guy so as I always like him when he shows up and does does my home's here and this is basically a standard a wire job there's nothing fancy just regular around smoke detectors that you saw right there to the left of that door because that is code so smoke detectors have to be there and this is the bathroom that we're looking and right now the master bathroom and on that left wall I'll show you that in a second that's where the electrical panel is going to be so 15 100 bucks or the total job that's how much it is so it's not exactly cheap materials I don't know what he for the materials because I didn't ask but I highly doubt they are half of that price so most of that is basically labor and as I have been saying throughout my videos any kind of work like electrician plumber roofing grating welding anything like that that you can go to a trade school nowadays it's becoming more and more rare and it's becoming more and more expensive because less and less people actually do it so the last competition there is in those fields the prices will go up and that goes for framing as well and pretty much a lot not only about construction it's pretty much a lot of duh I guess you can call it the blue-collar work the manual labor kind of work that is really getting phased out in our economy in our world and those prices are going up and I just don't see how they're going to come down anytime soon if there is no competition so we're gonna be living in some very interesting times at times when physical activity physical labor stuff like this it's just it's gonna be expensive and that's the reason why materials are do go up in price but they are that's my plumbing job right there which you saw from the previous episode materials are going up in price as well but the labor is what really gets you nowadays on construction so just keep that in mind and see if I cannot have mess for the labor is gonna cost you the more you can do yourself the better off you're gonna be and it's just it all depends what you're capable of doing and what you're capable physically doing because this some of this stuff is really labor-intensive and physically intensive it requires more than one person to do so it just all depends this is coming up on bait too by the way so it just all depends maybe you have some family members or you have you know some friends that can help you that's the way you're going to save money but what I'm trying to say is electricians plumbers and majority of like the stuff that you have to be licensed for framing that's gonna cost you it's not gonna be cheap so you definitely want to shop around hopefully my little channel is helping you with that a little bit so you get some ideas by the way you see the can lights right there and you also see the wire in the middle for the fan right there right at the top there's me there's gonna be a wire with with a light a wire a fan with a light up there when I put the tongue-and-groove up there so that's what's going that's what's gonna go there and this is how it all turns out so shop around for your trades and get multiple quotes and when you do decide to actually go ahead and move forward with your plans if you're going to be building and like I said hopefully my little channels helping you here with that do get it in writing so there's no surprises I also keep repeating that because it's worth repeating you want to get things in writing so you guys have a nice and smooth relationship whoever you're dealing with which is your electrician or plumber or heating and air whoever it is so there's no surprises so you don't have headaches as you know I get a lot of headaches as it is and I don't need any more of them so that's the way I do my business the guys that I work with now I really don't have to do that because I have a relationship going with them and I keep using them mr. time but if I'm new to this you definitely want to see that's how that looks that's just temporary you definitely want to get things on paper so there's no there's no issues and everything is straightforward and you guys know what to expect from each other the person that you hire they do that job that you agree done and then you pay them and that's how it's simple it should be put in construction it seldom really is so you really have to cover yourself and you really have to watch out and this is one of the many many reasons this is our the heating I'm sorry where the water heaters gonna go and the stackable washer/dryer kind of like a little tiny utility space so that's how you got to do things so you're a construction job your project is doesn't turn into a nightmare because there's a lot of willing people there's a lot of people with good ambitions and goals and dreams and once they start doing what I'm showing you here how this goes forward it depends who you connect yourself with and who you work with it can turn into a nightmare and I had some of those scenarios when I got early and I started in this business I've had quite a few of those stories myself so you pay people they don't want to show up anymore or they take their sweet time showing up and they show up one or two days out of a week sometimes the work that they do is not exactly up to your standard you have to have them redo it or you fail inspections because they didn't do things they were the way they were supposed to be done according to code or those people that you hired were not familiar with the local code there's a lot of a lot of things I dealt with and what I've learned through the hard way this is the reason why I want to be straightforward so you can see how this stuff works so I can save you that headache I can save you that problem and if my channel helps you with that that's nan mission is accomplished for me that's just how I look at things and you know I love looking at this this is like the skeleton of the house so even as I'm narrating and looking at the video I'm just makes me happy it's and the fun stuff by the way is coming up which I'm going to get inside and actually start doing some stuff inside the house which I like doing so that's gonna be coming up in the next couple of videos here you'll see me take over and the inside and pretty much do a lot of the work on the inside so that's that's how it turned out so the guy did a very good job they were like I said nice and neat after they cleaned up after themselves and I ran a broom the broom in device threw myself a little bit and that's what also construction is about you're gonna spend a lot of time cleaning not only building but cleaning yourself so keep that in mind you're gonna have to get familiar with a broom and see one of my favorite shots you can see all the framing everything is exposed and here's the bonus footage coming up so I'm just gonna be quiet and let you just watch kind of like the dark video that I took and a little bit more detailed when it comes to electrical so take care I'll see you the next one"

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"VideoID": "922",

"Title": "Residential electrical rough-in and walk through 🕵️",

"URL": "https://www.youtube.com/watch?v=dpyvYfU2JLk",

"Keyword": "Residential electrical construction",

"Transcript": "hello ladies and gentlemen this is uh ron doyle on maryland's eastern shore just uh finishing up another house here i'm gonna give you all a little walk through of what you can expect to see on a uh electrical rough end this is a 3 000 square foot home it is two and a half bathrooms it is three bedrooms with the unfinished bonus room this is the uh two-car garage it's pretty uh it's pretty big it's bigger than normal you would normally see i'm going to start here at the panel this is a home line a square d home line 4080 panel got all the wires pulled in one left to do one of the uh rg6 runs going to the entertainment center that's going to be mounted on a gas fireplace but i want to get this video before it gets dark on me so what we've got going on and what we've used in this house is a 1000 foot of 12.2 nm wire 2000 feet of 14 to 750 feet of 14 3 65 feet of 10 2 20 foot of 10 3 40 foot of eight three forty foot of six two three hundred foot of uh rg six and a hundred foot of eight two eighteen two and eighteen three wire four doorbell but uh basically i'm gonna give you all a little [Applause] a little uh walk around of what you can expect to see now so far the the uh i'm i'm the one that's finished the sprinkler guy you see the orange pipes that go through the sprinkler guy is uh finished his riser comes down uh this is the mud room his riser comes down right there he's finished the plumber's not finished the hvac guy is not finished uh there's there's actually my spools that are left over but uh this house is uh exterior walls are 2x6 construction interior walls uh are two by four construction uh the adjacent wall to the garage is two by six everything starts here i've got a few uh home run poles that are going underneath we've got one rg6 wire that is being pulled underneath everything else is up and overhead as you can see these are these are rg6 uh tv wires and uh what i like to do is uh drilling over two oversized holes and i usually split the difference and i try to keep them as straight as possible so that my pulling can be done by one person so i have to pull from i have to pull from the panel down these series of holes and pull extra slack right at this point here and then i pull them down those sets of holes and down those sets of holes but uh let's let's start you out at the front door got a uh two third view double french door coming in this customer opted for four ceiling cans right there doorbell on the right hand side and uh we're gonna do a walk around i've got one outlet on the front of the porch on that side we got one outlet on the front porch on this side we have got you can see that white box that's an outlet for the back deck area here they opted for two lights uh through the back wall got a light there and got a light right there right where that hole is at but uh you're coming through this front door area here this is the four-year area this area right here is an office area lots of windows got a nice uh got a nice view and this is uh waterfront property there's a creek that goes around through the back of the property this is the area that takes you upstairs this wall this wall was not calculated right they were going to put the hvac unit underneath the house they decided to do it in this closet this is also the coat closet you can see a header going across so the it's going to be a lack of room in that closet uh kind of interesting to see what's going to happen with this the space that's under the stairwell right here is dead space so coming in this front door as you would normally shut the door this is the it's this is the main door this is the secondary door your light switches are on this side uh the customer opted for a post lamp outside the post lamp outside is protected by a gfi directly below and i'm probably going to put a blank face gfi down below this is tied on a lighting circuit so if there's an arc fault issue it's going to trip at the panel right there in the garage if it is a gfi issue it's going to trip right here i choose to separate the two so that if it is a gfi issue it's not going to trip the whole lighting circuit everything that's on this but his post lamp is on that stake wire's coiled up and that trench cuts all the way over through here comes in on like a 45 right down through here and it goes into the side of the house right there another switch is for this can light that's a smoke detector another switch is going to be for this overhead light and the other switch is for the four cam lights that's outside this is the light switch for the uh this closet uh mechanical room slash coat closet the wire that you see coming from that box down that's for the gas furnace that i have a uh gas furnace uh switch plate on that gas furnace is going to be sitting right in here now coming into this room this is the great room large living room this is a bump out for the gas fireplace uh gas guys have not came here yet this is an in the wall tv box and i have a conduit pole which is an inch and a half that goes from there that can be fished for your low voltage on this side your 120 volt on that side and the entertainment equipment is going to be coming out through here and i've got a cut box basically cut the back of the box out to make a low voltage ring for it and uh you can do your future pulls with your rope through your uh conduit this is for the entertainment equipment power power it up on this particular side over here get an outlet he's going to have built-in cabinets on this side he's going to have a belting cabinet on this side to house the tv equipment and uh wire comes from this living room circuit it's fed underneath the house it's coiled up down in here and this is for the built-in gas fireplace so as you're coming through this front door coming in i try to keep my switches separate from right side and left side this side pertains to this room so it's less confusing to the people first switches you come to this is four ceiling cans two three and four that kind of lights the uh the perimeter and then the other switch that's at this box here is going to be for a remote controlled fan light combo right from there now uh this is the switch for the office area and every box that i use in a room i do a fan rated box so if the customer ever chooses to i can install a fan there later just coming into the living room if you look to the side you've got three gangs which box and you've got ceiling cans in the kitchen this is the kitchen area all this is kitchen area right here kitchen stops somewhere over in here down to here they've got a total of five cans in this in the kitchen one two three four five now the other switch is uh for the pendants that are over the island he's gonna do three pendants and if you see this wire coming across here you see this wire how it zigzags back and forth now these these romak staples are stapled loosely this guy did not have a kitchen layout for me to to follow so as you can see it ends right there now i'll what i'll end up doing is using a hole saw after he gets the island installed it's going to go somewhere in here i'll do a laser off the center of the island and i'll shoot it up and i'll do three equal measurements drilling a hole saw through the ceiling i can find that wire and i can do my tie in now on this particular corner he's doing a 12-inch cabinet he's doing a refrigerator so the refrigerator goes over that water valve in this outlets or the refrigerator and then his cabinets are going to start from here and go to the corner now code requirement is you have to have one within 24 inches of the corner which that one suffices that and then you have to have one no more than every four feet apart from there to there and you have to have one from the edge of the refrigerator over to that point which will be 24. like i said this one will cover this piece of cabinet and then we've got another outlet that's over here and it's just within four foot of this outlet now right here you got the uh a3 coming down for the range right down here so the range is going to sit somewhere in here he didn't have any of this laid out and i requested it and he gave me a center to center measurement from the center of the range to the center of the doorway and he also gave me a measurement from the edge of the doorway to the center his measurements were within three and a half inches of equaling out so got the range established got the uh my built-in microwave established up here then from his range measurements i'm within 24 inches of the edge of the range for the first outlet now i'm within four foot from that one to that one now his outlet his island or excuse me his cabinets are going to stop somewhere in here i've got to serve another wall area right here so there's going to be an outlet there this is the dining room area so i've got one in one here one there and one there oh this is dining room area now a lot of people might not know it but uh this is a sliding door this is the non-functioning part of the sliding door this accounts for usable wall space a lot of people don't know that so within six foot at the edge of this this door i'm not going to slide it over because the snow is going to fall in six foot from the edge of this doorway i have to have an outlet that's what that outlet's for and that outlet to that outlet right there is within 12 and that one to that one is within 12. now you also have to have one within six feet of the edge of this doorway breaking up the distance between these three outlets this is just the best place for it this is the uh this is the mud room area egressing into the garage you come in you'll be able to turn your lights on now opted to put them just to the edge of the doorway here because if i put them on this side they're going to fall behind the washer and the dryer which i do not want to happen especially if they do choose to do a front load washer and dryer you're always going to have to reach behind a washer and dryer to turn them on so definitely didn't want them here customer was already putting them here i got a four gang box um he opted for two lights on either side of the garage door there's one there there's one on that side and you've got two overhead lights in this garage which are there and there so one is the exterior garage lights one is the interior garage lights one is a spotlight he's got a spotlight center of the garage door 20 foot up on the side of the house so they can pay basketball to the edge dark if it gets dark on them they can keep playing it's going to light basically the front of this garage area up and then the other switch is for the light that's overhead as you come into this mud room now this area here is a kitchen pantry this outlet here because it's labeled on the print as kitchen pantry this outlet is tied into your kitchen counter circuit this is a lighting circuit this is tied for your overhead light this room right here is a half bathroom it is big enough to do a full bathroom in this area um but for some reason me talking to the plumbers the measurements weren't working out so they decided to do the sink so i got a vanity light here deciding to do a toilet here and all of this is open floor space uh this window kind of throws the um the idea of making this a full bathroom it kind of throws it out the window so they're getting a half bath in here washing machine dryer on that side dryer box they're doing a renai this is the hookups for the renai this is my outlet that powers the ring eye this is another outlet that i give them for doing a folding table over here coming back through we're going into the kitchen area i took you to that switch location over there now that switch location over there has a three-way goes from here to this box here and this turns on the kitchen cans the other switch over here turns on it's a three-way turns on the diamond light to that doorway now from that doorway as you're coming into the house you'll have a three-way over there that'll control the ceiling cans in this living room the other switch like i was telling you before is the two outside lights there's one there and one right there and the other switch controls the kitchen cans so there's a full way circuit there's a four-way circuit on these kitchen cans you can switch it here there and over there coming through the house let's uh take you upstairs just so you got an idea what this looks like all this is this is a wall but all this is loft area so they're gonna have hand railing from there all the way over to that wall this is temporary construction railing that has to be up to code uh so that the construction workers don't get injured but uh when i walk you all upstairs no sorry i didn't tell you the rest of the outlets uh this outlet here is within six foot of the edge of this doorway and then this serves the kitchen cabinet area or i say kitchen cabinet entertainment cabinets more like a dry bar this is more of an entertainment area i have to have an outlet within uh starting over here starting over here uh edge of this doorway so you don't get confused edge of this doorway this is the functioning door there's this doorway over to that outlet is within six feet and then from that outlet to that outlet is within 12. now i usually like doing my outlets consistent and if you notice that outlet's low and that outlet's low something happened with the windows they ordered uh transoms on these windows and they had to end up cutting these down lower which i had to drop my two outlets there and there like i said this is the built-in gas fireplace tv box this is where the flat screen tv is going to be now uh taking you through here this wall is over 24. well technically you need an outlet got it you know it's in a four-year area this is this four-year area is considered living space it's not a hallway it's a foyer so i have to have one on this corner this outlet is not going to get used that much believe it or not i need an outlet over here inspector would catch that if i didn't do it that outlet like i said is going to be a blank face gfi that protects the post lamp so that one doesn't count and this one does and that outlet has to be within six foot of the edge of the door not the trim not the casing the edge of the door from here to there it's gonna be within six got an outlet over there serving this corner and got another outlet over here serving this corner so we're gonna walk up the stairs it does a 90 degree turn on us got an outlet serving this wall i've got my light switches this light switch is uh for the stairwell going down now what's tied on that is that light is a wall sconce and a customer opted for a ceiling can is going to like this uh stairwell area that's on the first switch the second switch is uh for the center ceiling light fan if they choose that's on a fan rated box this switch right here this switch here is a three-way there's another three-way switch on that wall there and that's the control these three wall sconces one there one there and one there and this is this is to illuminate this walkway area the customer chose not to do ceiling cans in this area because if these lights are on it's going to flood the living room which he didn't want so i told him the options are wall sconces he can do up shines or he can do down shine wall sconces so we if he does reversible wall sconce we can flip them and try to keep the light up on this loft area and keep it from flooding down there if they're watching tv so there's no there's no glare on the tv or shining down on them uh the there's there's a wire coiled up under this floor approximately right here he wants a floor outlet that i've got to install after the hardwoods down so coming up got a outlet that serves this this wall here got a this is believe it or not this is a bedroom uh switch overhead light fan if they choose first outlet is within six feet of the door that one's pretty close and then from there to theirs within 12 and then from that outlet to that outlet is within 12. and in-house there has to be within six feet from the edge of that door which is a closet maybe six feet from the edge of that door from there within six feet now this ally is not going to get used that much we just came in this room that outlet has got to be within six feet the edge of this door this is a hallway outlet that serves this short hallway that starts there travels down to the store jam and this is a full bath got the shower on this side got a exhaust fan light usually it's uh i installed the braum 678 model now there is no wall space to put switches so this particular application the door is going to swing this way i've got these switches installed so that the edge of the door is going to stop right here before the switch don't want to land the switches behind the doorway it's it's nothing to coach saying that you can't do that i just choose not to i want to be able to see the switches when i walk in got a vanity light and an exhaust fan light combo toilet vanity fancy light a window right beside the vanity it's a really small bathroom and this here is another bedroom gotta have an outlet within six feet the edge of the door to the first outlet and you got a double closet and then you have to be within six feet from the edge of that door closet door so that outlet now i'm within 12 feet from that outlet to that outlet and i'm within 12 feet from that outlet to that outlet and i'm also within six feet from the edge of that door to that outlet all right i'm leaving this in this bedroom now this is this is a bonus room over the garage you can see the see the garage right there and this is a bonus room that is unfinished so he's had me prep it with we had a bird flying around in here he's had me prep it with a fan rated pancake one switch we have a switch here this is for the attic light i'm gonna have to pull my staircase right here and that covers the attic light and the light for the bedroom all right i see i'm sorry not this is not a bedroom this is a future bonus room none of this will be sheet rock to just have insulation it's going to have insulation in this wall and then i have insulation in this wall here and the rest of it won't be done the owner is choosing to do this at a later date now i did a future tv location here and a future power port right here i'm going to put a blank plate on it this room isn't getting any power there's no heating air equipment in here and i do not have to turn that on all right i'm going to leave this leave this bonus room this area right here this loft area they're going to use for gaming game room so it's it's open to the downstairs living room area this is a closet they chose to do an into wall tv box i've got my uh 120 volt and i've got my uh low voltage box that will supply to the intel tv box now this outlet here has to be within six foot from the edge of that over to here and i have to be within six feet to the edge of there this outlet here satellite right here it's got to be within six feet from the edge of that doorway to the edge of that i have to be within six feet from the edge of that closet door to there so i got away with one outlet on that wall and one on that wall i suggested to the owner of putting a floor outlet somewhere in here if they ever put a sectional couch or a couch in a love seat they could have a table lamp right there on the corner he chose not to now this doorway is actually your master bedroom walking in the master bedroom he's got an overhead light right here um this master bedroom is smaller this area right here so that light's going to cover this area got three gang switch box so first switch that you come to is the uh this smaller area right here and the second switch is your uh four perimeter ceiling cans which are there there there and there and then the other switch right here is going to be for your center fan and i think he's doing remotes in pretty much every room on the fans this is the master closet he opted for two lights in the master closet one there and one there and they're switched from this location now talking about smoke detectors all right i put it there instead of at the doorway because the hvac guy got ahead of me and he put every air return can't put it can't put a smoke detector by an air return so it is right here in front of the closet door on this closer to the exterior wall there was two windows there and there and they took them out for some reason this is uh this is the master uh bathroom as you come in uh the uh got a three gang switch here first one's going to be a vanity lights which are getting going there and there on that pancake and that slide rail box lined up with center of my piping so that it's directly above the sink the second location is going to be your exhaust fan or your light on the exhaust fan and the exhaust fan this is the gfi it's double ball sink so i have to have two outlets this would be gfi protected now this customer opted for a light which you can see that yellow wire hanging he wanted a ceiling can over the master shower which you can see the framing this is going to have a wet pan and where that light falls over the rim of the shower wall has to be gfi protected so that switch for that particular can is going to be at that location now there is a ceiling joist in the way i can't get a can in that location we're gonna end up doing an led wafer light so that will be drilled and installed on trim out now you know that this is a shower there's gonna be a freestanding tub right here another braum 678 model exhaust fan light combo got the window and this ladies and gentlemen is snow on the floor um you don't normally see this in the house but uh we are uh march the four i'm sorry january the 4th 2022 we just had a snowstorm and it blew over the blue under the eaves came in and landed on the floor in the master bedroom in the master bathroom this is the uh this is the toilet um got a little uh got a little wall separate separating us no doorway just a wall x in this room talk about smoke detectors a little bit more this room does not have to have a smoke detector it is not a bedroom now it's coming up the stairway uh you need a smoke detector on the first floor and second floor now the the smoke detector has to be adjacent to bedrooms there's a bedroom there's a bedroom there's a bedroom here okay you can get away with one smoke detector if you notice there's an air return there there's an air return right there i can't put a smoke detector in this location i have to keep it away so i've got the smoke detector location there that serves adjacent two bedroom quarters there's a smoke detector in the bedroom there there's a smoke detector right there now as we go down the stairway hopefully i'm not making you dizzy you should get it on the stairway that's a smoke detector right there that's one that serves the first floor and that's all the smoke detectors that are in this house so we're going to do a walk around outside the house [Applause] crawl space egress this house has got a um sewer alarm and it's got a sewer pump and they couldn't tell me the location so the wires are hanging and on this side right here we've got the post lamp wire coming out under the ground already trenched that in and uh on this side of the crawl door you get thermostat wire hanging that's gonna be the doorbell transformer and the surface light and surface outlet it's gonna be right here and then somewhere in this area here the well company will hook up the expansion tank for the well [Applause] this area here i get a patio or deck in the future hunter's not doing it right now those are those two wall legs i was telling you about one right there right there that was the window that was taken out this is where the hvac condensing units are going to be there's going to be one here one there there's going to be one right here originally we had planned to do a mini split system for that future bonus room and now they opted to do a regular hvac system meter socket service outlet for servicing the equipment has to be within 25 feet in line of sight that's there the first gfi in this location is right there that is a tamper so it's a trwr tamper weather resistant and this is the uh this isn't this is a extra duty arlington wet located rated box it's got a built-in j-channel that i use on all the houses so this installing this actually uh gets me out of the way the vinyl siding guys and it doesn't hold them up now they have to flash around this uh got the meter stock installed i already got it flash taped around it with the 5k tape uh this is a con state discharge got my arlington bridge block these are my see a tv cable wires coming out now looking at this garage got a light there got a light on that side and that 20 foot tall light is in between those two windows it's going to shine down for this driveway area right in here the driveway is gonna run right out where those star tracks are [Applause] nice little curved sidewalk goes right in here this is where your post lamp is this is where guests would come walking up to the house so lots of windows lots of lights hello ladies and gentlemen uh this is rondo with you uh hopefully this video was helped to you all so you can see what uh you can expect to see on a walk through after electrician is done with your house hopefully this video was of some help to you and uh if you like this content please give me a like press that like button greatly appreciate it and consider subscribing to my channel for future"

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"VideoID": "923",

"Title": "Time Lapse Electrical, Plumbing, and Prep for Drywall: House Construction: Episode 10",

"URL": "https://www.youtube.com/watch?v=ptkaVQKEMHg",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] so [Music] [Music] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] [Music] [Music] so [Music] [Applause] [Music] [Applause] [Music] [Applause] [Music] you"

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"VideoID": "924",

"Title": "Ground Neutral and Hot wires explained - electrical engineering grounding ground fault",

"URL": "https://www.youtube.com/watch?v=P-W42tk-fWc",

"Keyword": "Residential electrical construction",

"Transcript": "Hey there guys. Paul here from TheEngineeringMindset.com. In this video, we're going to\nbe looking at the difference between the hot, neutral and ground wires as well as the function of\neach with some worked examples. This video is for homes in North America. If you are outside this region then you can still follow along\nbut your system will work and look a bit different, so\ndo check out our other videos. Remember, electricity is\ndangerous and can be fatal. You should be qualified and competent to carry out any electrical work. Before we get into this video, there are three things\nI need you to remember. Number one, electricity will only flow in a complete circuit. If you come into contact\nwith an electrical conductor, your body might complete the circuit. Number two is that\nelectricity always tries to return to its source and number three, electricity will take all available paths to complete a circuit but\nit will take preference to a path with less\nresistance and so more current is going to flow in that path. So we're going to be looking at the hot, neutral and ground wires for a typical North American\nresidential electrical circuit. First we'll see a really simple circuit to understand how it works, then we're going to apply this knowledge to a complex residential installation. When we look at a simple\nelectrical circuit with just a battery and a lamp, we know that to turn the lamp on we need to connect both ends of the wires to the terminals of the battery. Once we connect these wires, the circuit is now complete\nand electrons can flow from the negative through the lamp and then back to the positive terminal. So for the circuit to be complete, we need a wire to carry the\nelectrons from the power supply and over to the light. This wire is our hot wire, then we need to connect\nanother wire from the lamp and back to the battery for the electrons to get back to their power\nsupply or from their source, and this wire is our neutral wire. The hot wire carries electricity\nfrom the power supply and then will take this over to the load. The neutral wire carries\nthe used electricity back to the power supply. If we look at a residential\nelectrical system in North America, then we\nwill find two hot wires a neutral wire and some ground wires. If you want to see in\ndetail how this all works then check out our video for that, links in the video description below. Now, imagine for a second,\nthe homes electrical system is connected to a battery\nand we have just one hot wire and a neutral wire. And as we saw with the simple circuit, for the light to turn\non, we need a hot wire to the supply of the current to the load and we need the neutral wire to return the current to the source. Electricity therefore\nflows through the hot, through the busbar and the circuit breaker\nand into the light. It then travels back through the neutral and over to its electrical source. Now, of course homes are\nnot connected to a battery, they are connected to transformers. So we're gonna replace the\nbattery with a transformer and there we go, we\nhave a complete circuit. The electricity in this circuit\nis AC, alternating current, which is different from\nthe DC, direct current, which we saw with the battery. With DC, the electrons flow directly from A to B in only one direction, much like the flow of water down a river, but in our homes we have\nAC, alternating current, which means the electrons\nalternate their direction between forwards and backwards much like the tide of the sea. Now, in North America, we\nhave a split phase supply to most residential properties. So we have the two hot\nwires and one neutral wire. We simply have two 120V coils\nwhich are connected together in the transformer. The neutral is then\nconnected to the centre between the two coils. When we connect our multimeter between a hot and the neutral, then we're going to get\na reading of around 120V, and we get the same\nreading for the other one. That's because we're only\nusing half of the coil in the transformer. But then when we connect\nbetween the two hots, we get 240V because we're\nusing the full length of the transformer coil. Now, if you don't have a multimeter, I highly encourage you to get one, links down below for which\none to get and from where. Now, if we have a load on\nonly one half of the coil and the load is, for example, 20Amps, then the hot wire will\ncarry 20Amps to the load and the neutral wire will carry\n20Amps back to the source. You can measure the current in a cable using a current clamp meter. Again, links down below for\nwhich one to get and from where. If you don't know what\ncurrent or amps are, then check out our video\non electrical current, link to that in the video\ndescription below also. Now, if we have another load\non our other half of the coil and the load is a different value, say for example just 15Amps,then\nthe neutral will only carry the difference between\nthese two values back to the transformer or back\nto the electrical source. So in this case, one side we have 20Amps and the other side we have 15Amps, so the difference between\nthese is five amps. So the neutral will carry five amps. Where does the rest of this go? Well, it will pass\nthrough the two hot wires. And this is what we have in most cases because there are multiple\ncircuits with different loads in the residential property. However, if we had a load on both coils and they're of equal value,\nsay for example 15Amps each. Then there will be no current\nflowing in the neutral wire. So where is it going? Well, it's flowing back and\nforth on the two hot wires between the load and the source. That's because it's AC,\nalternating current, and the transformer is\ncentre tapped with a neutral. So while one half is moving forwards, the other half is moving backwards and the current will flow\ninto the other circuit instead of back via the neutral. Hopefully, that hasn't\nconfused you too much. If it has, then don't worry\nabout it too much for now, we're gonna cover that\nin a more advanced video. So the hot wires carry\nthe electrical current from the supply and over to the load and the neutral wires carry\nthe electrical current from the load and back to the supply. So what does the ground wire do? The ground wire, under\nnormal operating conditions, will not carry any electrical current. This wire will only\ncarry electrical current in the event of a ground fault. Hopefully, this wire will\notherwise never ever be used at all in its entire life. It's just there for an emergency path for the electricity to get\nback to the power source instead of it passing through you. The ground wire in most\ncases is a bare copper wire, it's uninsulated, but in\nsome cases it is covered with a green insulation. This wire has a very very low resistance so electricity will\nprefer to travel along it because it's easier and\ncan get back quicker. Now if we go back to the simple circuit with a battery and a lamp,\nif we now run another wire and run this from the positive\nterminal over to the lamp and we connect this to the\nmetal of the lamp holder, then this is effectively our ground wire. As you can see, it's not being\nused to carry electricity. If the hot wire touches the metal casing then the electricity will now flow through the ground wire instead. If the hot wire is connected\nto both the neutral and the ground, then it will now flow through both wires back to the source. But as the ground wire\nhas less resistance, then more current will flow through it. When electricity finds a\nway to leave its circuit and return to the source\nthrough a different way than its neutral wire, this\nis called a ground fault. Coming back to the house, the electricity flows through the hot wire and into the light and then\nback through the neutral, but if the hot touches the metal casing, then it will instead flow\nthrough the ground wire back to the panel, through the busbar and then back to the transformer\nvia the neutral wire. The ground wire has a very low resistance which causes a huge and\ninstantaneous increase in current which will trip the breaker. We therefore connect the\nground wires to anything that could potentially\nbecome a potential path for electricity to leave its circuit, such as the metal pipes, the metal plates and the light switches and\nthe outlets of the boxes, we also need to run one to the outlets because often our\nappliances are made of metal or they're covered with a metal casing, the things like washing\nmachines and microwaves. When you look at a receptacle and plug, you'll see that there is a hot terminal, a neutral terminal and a ground terminal. The casing of something\nlike a washing machine is connected to a ground wire in the lead which goes to the plug,\nthrough the receptacle and back to the panel to save\nyou from an electric shock. Now, let's say you're\noutside with no shoes on and the ground or the soil is moist. If you touch a hot wire, you\ncould complete the circuit and current may pass through\nyou to get back to the supply. In this case, the resistance\nis going to be very high. So the current might not be high enough to automatically flip the\nbreaker and cut the power. This will likely lead\nto the person's death. Luckily we have the GFCI\nreceptacle or the GFCI breaker. GFCI stands for Ground\nFault Circuit Interrupter. We're gonna look at a\ncircuit breaker version but essentially they're\ngonna work the same. This GFCI breaker is going to be connected to both the hot and the\nneutral of the circuit, and so we can monitor the wires and ensure that the current running in\nthe hot wire of the circuit is equal to the current running in the neutral wire of the circuit. If the current is not\nequal in these two wires, then it's clearly flowing\nback to the source via another route, we\nthen have a ground fault. The breaker will realize\nthis and very quickly and automatically flip to cut the power and kill the circuit. Connected to the main panel, we will find a thick copper wire which leads out to a ground rod. A ground rod is buried into the ground outside near the property. This rod is not used for ground faults. Its purpose is to dissipate\nstatic electricity and external high voltages\nlike lightning strikes. There is also a ground rod\nconnected to the neutral at the transformer. Many people think that\nduring a ground fault electricity flows through the ground rod and into the earth. Now, remember electricity tries\nto get back to its source. It doesn't just go into the earth. Unless there is a ground\nrod at the transformer, then there is a potential\npath for the electricity to get back to the source,\nbut this path will have a very high resistance for impedance. And as we know, electricity\nwill take preference over the path with the least resistance. So as we already have a very\nlow resistance ground wire which provides a path\ndirectly back to the source, the ground fault is going\nto take this route instead. When it comes to lightning, the source of lightning\nis essentially the earth. So lightning is always trying\nto get back to its source which is the earth. If lightning strikes the utility cables, it will flow along the wires\nto get to the ground rods of both the transformer\nand also your main panel. It's gonna do this to try\nand get back into the earth. If it wasn't for this,\nthen it's going to blow all our circuits then it's\ngonna cause house fires. Now, if the hot wire\ncame into direct contact with the ground rod, then\nelectricity will flow through the soil, back to the transformer, but the resistance is very high\nso the current will be low. This means the circuit breaker will not likely detect the fault and the circuit breaker\nwill not automatically flip to cut the power. Okay guys, that's it for this video but to continue learning, then click on one of\nthe videos onscreen now and I'll catch you there\nfor the next lesson. Don't forget to follow us on\nFacebook, Twitter, Instagram, as well as TheEngineeringMindset.com."

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"VideoID": "925",

"Title": "#bluecollar #electrician #residential #electrical #sparky #comedyvideos #construction",

"URL": "https://www.youtube.com/watch?v=qiz-0zEkiMk",

"Keyword": "Residential electrical construction",

"Transcript": "I had a customer tell me one time well it only took you 15 minutes so why are you charging so much I always respond back well there's experience and then there's unexperienced should I be penalized because I'm experienced and I'm fast and efficient at what I do would it really make you feel better if I sat down on a bucket maybe waited an hour or two then came and got you and said we're done at the end of the day you pay me by my experience and not my time and if that's a problem feel free to call someone else"

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"VideoID": "926",

"Title": "Residential Electrical Wiring 101",

"URL": "https://www.youtube.com/watch?v=RaoHxaQKTOM",

"Keyword": "Residential electrical construction",

"Transcript": "so here's how some basic wiring works in your house this wire is coming from your breaker box it's going to go to your light switch and then your light switch is going to either let it keep going on to your light or the light switch is going to stop it from going on your light power travels out the black one Powers whatever it needs to power and then travels back on the white one this bare ground one is just there in case like something goes wrong it wants to have an easy escape to take the extra power back out and run it literally into the ground"

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"VideoID": "927",

"Title": "How to layout Electrical in one room -BuildingTheWay",

"URL": "https://www.youtube.com/watch?v=mEl294senUg",

"Keyword": "Residential electrical construction",

"Transcript": "you okay what we're going to show here is the typical home run going into a bedroom I know that existing houses and fixer uppers and rehabs already have their outlets but I want to show you a brand new construction so that we understand electricity okay typical bedroom we're going to focus on the bedroom the first thing we want to do is put outlets most the time you're going to see two outlets per per wall in this case here we can put a window everywhere but we're just going to show you the electrical okay we'll put an outlet here and that's a symbol of an outlet okay another outlet here and maybe one more over here okay now we have all our outlets in our bedroom okay we're not worried about the bathroom or the closet or anything they're just basically right in here now from here how do we hook it up to the main box we're going to pick the closest one to the main box in this case we'll start with this one here we'll put an H for a home run that means from here it is going to the main box after that we'll hook up the rest of the our outlets and now we're done okay now the only thing we need here is our light okay so our light will be in the center most of time on new homes you won't have lights in the center in this case we're going to have our line in the center with our switch right here on the side our switch will go to our light and how do we hook this up from our last one the power there now we have our lights and our outlets hooked up together and our home run what type wire will we use we're going to use a 14-2 what kind of breaker it's going to be a 15 amp breaker and this will be an arc fault okay and we start here go around and we end up here and we'll hook up there so everything will be a 14-2 and that's how we'll do a typical bedroom with its own breaker okay how many outlets can we put on there depends on what we're putting up on the outlets in this case here we have plenty we can maybe do two rooms okay so that is a typical layout for a bedroom you"

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"VideoID": "928",

"Title": "INSANE! Residential electrical wiring. Clean! #electrician #oddlysatisfying",

"URL": "https://www.youtube.com/watch?v=mxF7cHPpDa0",

"Keyword": "Residential electrical construction",

"Transcript": "okay let's talk about wiring 101 now residential wiring 101 this is um this is just clean I me you know straight into the box I hate those big Loops outside of the box because you're never going to need more wire it's only 6 in of free conductor from the back of the box is all you're supposed to have and then you have to have your wire stapled within 6 Ines of the box so why have those big giant Loops it's actually a code violation it's not inside the box but there is free conductor out there but this just clean as a whistle you could stick any device in there look at that plenty of room the neutrals and grounds are back there great work"

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"VideoID": "929",

"Title": "Rough Electrical Inspection [Residential CEC/NEC] Part 2",

"URL": "https://www.youtube.com/watch?v=TElw-O8ps4I",

"Keyword": "Residential electrical construction",

"Transcript": "welcome back to part two in this video i will go over minimum electrical code requirements that are specific to areas of the inside and the outside of a new single family dwelling let's do this [Music] now in terms of where to start the rough inspections many often choose to start the rough inspections within the attached garage the reason may be because the garage is where a mixture of work usually takes place such as the installation of the water heater furnace and if the electrical service panel is installed within the garage and often it is then it is where branch circuits originate and branch out to feed electricity throughout the house and the following requirements apply at both attached and detached garages that have electrical power a minimum of one wall switch control lighting outlet must be installed within the garage a wall switch control lighting outlet must also be installed to provide illumination on the exterior side of the garage exit entrance door the code also requires that a minimum of one receptacle outlet is installed for each vehicle bay and the receptacle must be no more than five and a half foot above the floor verify that circuit breakers at the installed electrical panels will not be located more than six foot seven inches from the floor or working platform to the grip of the breaker operating handle at its highest position and verify that there is a metal mud ring installed where the eufer ground and the grounding electrode conductor intersect and connect this can help assure the clamp connection will not be covered by the installation of the drywall later in the phase now in california new single family dwellings are required to provide for future electric vehicle chargers which includes the installation of a one-inch minimum conduit raceway that originates at the main service or sub-panel and terminates into an outlet box in proximity to the location of the future ev charger the service or sub-panel must also provide capacity to install a 40 amp minimum dedicated branch circuit and a space reserved to allow for the installation of the breaker keep in mind that the code merely requires accommodations for future electric vehicle installation the installation of battery systems within an attached garage require the installation of a smoke alarm or a heat detector in proximity to the batteries the smoke alarm or heat detector must also be interconnected with the smoke and carbon monoxide alarms that are already required within the dwelling so be sure this device is roughed in at this inspection before proceeding into the kitchen area let us briefly go over the two types of recess luminaires you will encounter in residential construction ic rated and non-ic rated luminaires ic rated luminaires which stands for insulation contact are permitted to be in contact with insulation and may also be in contact with combustible construction whereas non-ic rated luminaires which stands for non-insulation contact may not be in contact with insulation and must maintain separation from insulation of no less than three inches also non-ic rated luminaires cannot be in contact with combustibles and must maintain no less than a half an inch from combustible construction in kitchen areas at least one wall switch control lighting outlet is required and although kitchen countertops are normally not installed during the rough electrical inspection the wall countertop receptacle outlets are and should be roughed in therefore the kitchen floor plan should be reviewed in order to verify the proposed location of the kitchen countertops as it relates to the receptacle outlets placement requirements and receptacle serving countertops must be installed so that no point along the wall line is more than two feet horizontally from a receptacle so the idea with the kitchen countertop receptacle outlet spacing is that say you have an appliance with a two foot cord you should be able to plug into either one of these two receptacles these wall counter top receptacles must also be installed no greater than 20 inches above the countertop kitchen islands and peninsulas are some of the most common in residential kitchens and each require a minimum of one receptacle outlet unless the island or peninsula is separated by an appliance or a sink a separated island or peninsula is created when the depth behind the sink or appliance as shown here is less than 12 inches in this scenario each separate countertop space will require a minimum of one receptacle outlet however if the space behind the appliance or sink is more than 12 inches only one receptacle is required moving on to laundry areas a minimum of one receptacle outlet is required to be installed within this area this required outlet or outlets must be supplied by a dedicated 20 amp branch circuit the washer or a gas dryer are permitted to be served by the circuit however no other loads can be supplied by this circuit such as an electric clothes dryer which typically requires a 30 amp branch circuit with four conductors hallways that are 10 foot or more in length must have a minimum of one receptacle outlet installed a minimum of one wall switch control lighting outlet is also required to serve hallway areas and verify that a smoke and carbon monoxide alarm outlet is roughed in the hallway in proximity to the bedrooms a interior stairways similar to hallways must have a minimum of one wall switch controlled lighting outlet to illuminate the landings and treads and stairways with six or more risers between floor levels must have a wall switch at each floor level to control the stairway lighting smoke and carbon monoxide alarms are usually required in proximity to the upper and lower area of the stairway at each floor level and assure the devices are roughed in at this inspection moving on to bathrooms at least one wall switch control lighting outlet is required within a bathroom a minimum of one receptacle outlet must also be installed in a bathroom and within three feet of the outside edge of the sink or sinks so since a bathroom receptacle must be within 36 inches or three foot from each of the bathroom sinks if this receptacle outlet was serving both sinks then it wouldn't be conforming to the code since the receptacle outlet would properly serve this sink however it wouldn't be within 36 inches of the secondary sink luminaires installed within three foot horizontally from the tub or shower up to a height of eight feet vertically from the top of the tub rim or the top of the shower threshold must be marked suitable for damp locations or marked suitable for wet locations where the luminaire will be subject to shower spray in bedrooms a minimum of one wall switch controlled lighting outlet is required verify that a smoke alarm outlet is roughed in the bedroom also in bedrooms the electrical code requires receptacles installed so that no point measured horizontally along the floor line is more than six feet from a receptacle and if there is a wall two foot or wider in the room then a receptacle is required in that two foot section of wall and by gaining a good understanding of these minimum requirements we're covering in this video will allow you to walk new work and be able to identify if there are any issues with the layout of the electrical receptacles or if there's a missing outlet for the smoke alarm within the bedroom closed closets have specific requirements related to where luminaires can and cannot be installed and here is a great illustration courtesy of codecheck which deciphers very well the clearance requirements of luminaires also ensure that sub-panels are not installed within closed closets or within bathrooms attics underfloor spaces utility rooms or basements that are used for storage or that contain equipment requiring servicing must be provided with a lighting outlet and the switch control to the lighting outlet must be installed at the point of entry to the space electrical cables that are installed within six feet of an attic access that are accessible by a ceiling opening must be protected by guard strips where electrical cables are ran across the floor joists or rafters as we make our way to the exterior of the dwelling exterior doors must have a wall switch control lighting outlet that provides illumination to the exterior side of the entrance exit door to the dwelling also ensure that a minimum of two receptacle outlets are installed on the outside of a dwelling one on the front and one on the rear of the dwelling heating air conditioning and refrigeration equipment installed on the exterior of a dwelling must have at least one receptacle installed for service purposes within 25 feet of the equipment exterior balconies decks and porches that are attached to a dwelling and that are accessible from the inside of the dwelling must have at least one receptacle outlet installed and a quick note on energy requirements which are verified during this inspection assure that the reese's luminaires and ceilings are icy rated and that they are certified airtight and you can usually find this label within the housing as shown here before concluding i want to reiterate that all code items presented in this video are minimum requirements buildings can be designed and built above code but never below code minimums so always defer to the approved plans however keep in mind these code minimums as you are inspecting designing or building a home this concludes the rough electrical inspection series it has been a great pleasure presenting this information to you stay tuned for the next rough trades inspection discipline stay frosty and stay awesome"

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"VideoID": "933",

"Title": "Residential⚡ Electrical rough-in and walk through",

"URL": "https://www.youtube.com/watch?v=J3jotQFZ5vA",

"Keyword": "Residential electrical construction",

"Transcript": "hello ladies and gentlemen this is ron doyle on maryland's eastern shore i just finished up roughing in this uh rough wiring on this house i want to do a little uh walk through um i'm sure there's a lot of people that haven't seen a rough-in on a house the plumbers are almost done the sprinkler guy a fire suppression guy they're done and i'm the electrician and i'm finishing up i've already swept out the house we'll start you at the panel uh actually let's tell you a little bit about this house it is a 1 600 square foot house 2 story four bedrooms two and a half baths and it has a two car garage um a lot of people might wonder how much wire is actually used in a house this size uh we got 500 foot of rg6 for tv 2000 feet of 14.2 nm nm is the uh trade name for romex is a slang name for it uh 750 foot of 12.2 uh 750 feet of 14 3 250 feet at 10 22. 50 foot of uh 10 3 65 foot of 8 2 and 58 foot of a3 is all in this house uh that's 1600 square foot and uh you can see my spools that i've stacked up believe it or not this is the uh this is the wire left over from this job not a whole lot left starting at this panel this is a square d uh home line uh 200 amp 30 spaces i did most of my runs up and overhead you can see i keep my i group my wires 120 volt on the right side and 240 volt wires on the left side of course this is your rg6 for your tv cables there's five runs home runs in the house with that um but uh got very few runs going underneath the house uh it's four runs uh one's for outside outlet loop um outside outlets and loop for under the house for uh service outlets for the heat and air equipment we have a 10-2 for the downstairs air handler and we have another 10-2 for the upstairs condensing unit and the other 10 the other 12-2 is the downstairs condensing unit very few runs underneath the house most is up and overhead uh in this panel i've got one breaker hooked up this one's going to be feeding the as a 28 breaker it's going to be feeding the outside receptacles and the wire loop under the house this is in here just as a filler because of course square d uh likes to knock the links to knock the two spaces out and to pass code the store has to be on and all the spaces have to be filled so you don't want to break them out until you're ready to install all the breakers in this panel this is the two-car garage this is the neo-angle egress to go into the house and give you a little walk through got uh two outlets one on either side it's behind that door for the garage the outlet beside the panel that's the outside outlet loop outside outlets i wire mine separately um so that the vinyl siding guys can j channel around the box and my box won't be in their way because it has it's a it's an arlington heavy duty extra duty in use box with a weather tight or a weather resistant tamper-proof outlet i've got one on the front of the house and i've got one on the back of the house right there uh this house is gonna get a 12x12 deck off the back uh with a center stairs uh this is the this is the four-year area this is a this is a coat closet this is a pistol sink toilet for half bath uh a lot of this stuff's hard to make out because you can't see defined walls with sheet rock this is a water heater closet underneath the staircase is dead space uh this is the upstairs with with a 180 degree 180 degree turn to go upstairs take you up here in a minute uh now we're in worcester county so they require a flow switch and of course you got your sprinkler system flow switch is going to go somewhere in here and i've got my wire coming down feeding into this box this is a smoke detector wire that feeds into this so that the flow switch can be hooked up basically if water flow is detected going up this pipe it sets the smoke detectors off inside the house i've got another video of how i wire those uh if you're interested in following that it's uh it's on my youtube water heater walking in here this is the dining room area got a dining room light right there diner in light switches over there we have the kitchen area is right in here so this is a wide open floor plan this is the living room area of course this is the egress from the garage now i've got it mapped out so that i can't be wrong on this this layout if you can see this right in here right in here is a island the circles in the x are where the pendants are at there's two pendants in this kitchen line up with that uh klein um shout out decline klein uh laser level plum bob awesome product i do my layout on the floor i put the laser level uh plum bob on each center x and that gives me a position on the ceiling so very unlikely that this is wrong uh refrigerator goes here and we've got a 15 inch cabinet that goes between this space here 30 inch range from that line to that line and then right here gets a 10 inch cabinet this is a from that line here it's a 36 inch lazy susan that lazy susan carries over to this window and then he'll the contractor um we'll do another cabinet i didn't pull a measurement on it uh it doesn't really concern me on this one but he'll do a cabinet in here and normally it's a 15 inch then he'll do a 36 inch sink base from here to over here and then he'll do a dishwasher right here that's what the wire the white wire is for and then you get a he gets a 24 inch pantry it's right here um now with my dishwasher wiring of course i've got all my wires up and overhead as you can see follow them down they're all lined up going to the panel it's a pretty straight shot but uh all my wires are up and overhead i run my dishwasher line underneath of the sink with an adjustable box that actually comes in and goes out so that it could be flushed to the inside of the cabinet you turn this screw and this box comes in and out very nice product made by uh they're kind of pricey i used one for there and i used one for the uh above the range microwave adjustable box there um that's a home run for the microwave i've got a home run that lands on this 15 inch counter right here and then it jumps on behind it to the refrigerator and then of course this wire that goes down is gonna be my wire loop travels under this floor and it's coiled up over here and that's for the uh the island that gets an outlet on that end of the island of course we're on the 2017 code i only have to do one out one outlet per island uh we're not on the 2020 yet um but uh the other kitchen counter circuit because you have to have two kitchen counter circuits this is the other kitchen counter circuit it's based four foot apart and i got another one there which was was within four foot apart and then i've got one that serves this side of the kitchen counter um just on the other the other side of the sink and pantry go here and this outlet and this outlet are within 12 feet apart this outlet falls on the living room side so i've got my living room wire together as you can see got an outlet here by the doorway this is a sliding door sliding door goes this direction light switches are on that side this customer opted for a in-wall tv box another arlington product love them this is a new work all work low voltage uh 120 volt side box right here the wires will be pulled in after the insulation is in place i've got a high powered magnet i can fish the wires up the wall got a cut box i cut the box out this is my home run over there by the panel in the garage but my other poles come through here and i use a feather board on the front for the cables to come out for the rg hdmi cable and the rg6 cables that come out of here and all these outlets are within 12 foot of each other some of them are closer than others these two are closer put an outlet over here and you got an outlet behind this gang box you see that but uh most of my runs are up and over got a group of light switches um got the right fan left fan this is the garage and this is the uh kitchen uh three-way circuit i'm sorry uh living room three-way circuit coming into this this four-year here this first switch is three-way and that's three-way again over there the second one is uh outside lights and uh this third one is your stairwell light which is way up there we usually do a hanging pendant coming into here you can turn your you can turn your uh your fourier light off right here and uh this is another three way for the kitchen cans we have we have four cans in this kitchen you can see them right there kind of doing an l shape and then uh this this switch right here is for your two pendant lights that land over the uh the island that i marked out on the floor um the dining room dining room late we'll be here it's going to be a light that goes over the table sits right here and you got a three-way kitchen you got a three-way uh three-way living room three-way kitchen outside lights and then the dining room give you a little walk through no um this is the first floor smoke detector of course i've got that tied into this 1900 box with an extension ring and a mud ring i'm gonna go upstairs so we got another three-way coming upstairs to turn this uh stairwell light off three ways right here right at the top of the landing and there's your light so coming up here hopefully i don't make you dizzy coming up here this is the entrance to the uh hall bathroom got a linen closet fiberglass uh one piece shower tub toilets here sink of course i got my um got my 120 volt outlet uh got a vanity light which is right there it's on the slide rail and then this is my exhaust fan light combo i use braum i believe they're 678 model exhaust fans i use quite a few of those and it's duct to the eave this is the second floor laundry room you got the dryer on this side and washing machine on this side this is the master bedroom it's pretty good size pretty good size bedroom and it's the master closet master closet i put switch and we've got an overhead light into the master closet this is the master bathroom and this is the vanity light i always use the first switch this is your exhaust fan the switch i have to do a gfi protected ceiling can over top of the uh it's going to be a full tile shower with a fiberglass one piece fiberglass wet wet pan for the base uh got a six inch can it's got the gfi protected because it falls over falls over the rim of the shower and uh this is going to be the switch for the can this is going to be the outlet which is gfi protected it's another outlet on this side this is a double bowl sink here this is your toilet and of course your shower walking out of this room this is your hallway we've got we've got a scuttle hole for upstairs access we've got a light there that is a second floor smoke detector and that is going to be a light there with that pancake this is a air return to the right here this is another bedroom now due to wire being very expensive right now at coronavirus uh we are october the 31st 2021 currently uh wire is very scarce uh that's very expensive so um i told the contractor until the wire price has come back down to ground zero i'm only doing a fan light switch together so 14 2 um switched overhead got a fan rated pancake and we have our smoke detector uh directly above the doorway coming in the bedroom and uh of course it has a uh it's gonna have a a pretty big closet in that bedroom this bedroom here you've got uh small bedroom um same thing fourteen two uh switch for the uh fan and light it's gonna be switched together and of course we got our outlets that are within code you gotta have one within uh six foot from the uh casing of the door over and then you have to have outlets within every 12 foot so that outlet tadala outlet falls within 12 and then you got one that falls under that window and then you got one that is within from there to there it's within six feet of the doorway and that is a tv box this room has got another walk this has got a walk-in closet there's a light got an overhead box for that and this closet's got a window in it um this is the second one we've done like that now in this in this hallway you can see there's a box high that box is for the surface light that is in this attic you can see it right there line sets are already prepped in this is going to be where the unit is going to be for the second floor um this is uh this is going to be a three-way for your hallway light up here and the other switch is on that wall right there and then we got this bedroom to the end of the house this was uh this was an add-on we don't normally do this room um to the right we got a pretty wide closet now i've got an outlet i hate doing this but i have to uh if the wall is uh larger than 20 24 inches i believe it is if the wall is wider than 24 from door jamb to door jamb you have to have an outlet there so uh that's gonna be an outlet that doesn't get used very often we've got an outlet within of course six feet of the doorway which that one's pretty close this one was within 12 and then from there to there it's within 12 and then there to there it's within 12. and then we've got a tv box now i have to also be within six foot from the edge of this trim on this closet door to that box which i am i'll give you a little uh kind of little description of how the outlets are laid out in this house but uh this is just a little walk through um thermostat for upstairs this is a little walk through to give you all uh an idea of what a roughed end application looks like and this is you can see this brown wire here this is my uh doorbell i like to call it ding-dong customers get a kick out of that um sometimes these wires um get covered up by the sheetrocker they'll lay the sheetrock on this and i'll have to find this wire not i don't know if they do it because they miss it or they're doing it for uh kicks and giggles uh i don't know but uh it can get interesting when you have to locate wires that are hidden behind a wall and you're trying to dig the wire out without damaging it um look i hope uh this was insightful for you that uh you all thought was interesting um this will give a a little better understanding to what a rough end looks like for from an electrician's standpoint um and this is also a good opportunity to show my grandsons uh joey lewis in august what uh what the grandfather does for a living i don't get to see them very much they were in germany see my son-in-law is in the air force and uh my uh my my daughter and him were over in germany for a few years they have came back to the united states they're now stationed in seattle washington so and got a brief uh visit with them so they don't get to spend a whole lot of time or interaction with with me or the uh my my ex-wife but uh you know hey they can see what their grandfather does for a living um i'll give him a i'll give him a heads up tell him look for this video uh i love you boys i hope uh hope one day when you all grow up get older uh i'll give you a little uh training how to be uh electrician if you uh if you choose to do that but uh hey look ladies and gentlemen thank you for uh for watching this is ron doyle with you and i hope you have a wonderful and blessed day"

},

{

"VideoID": "935",

"Title": "Interior Design: Residential Lighting and Electrical Planning",

"URL": "https://www.youtube.com/watch?v=lRV8P9zr9FE",

"Keyword": "Residential electrical construction",

"Transcript": "hello there it's ji rose with you for just a a minute i wanted to speak to you about generally laying out your electrical and your lighting and your furniture plan so we don't do this all at once but we have to think about all of it all at once the first thing i i do once i have my floor plan and the walls to find the bathroom space is defined i will go in and i will find the center lines of all my my rooms i find the center line of this hallway space i come into the floor plan i will start to then find the center line of the entry doors over here there is a center line through this door you don't see it but that's the center i made a center line in the room which i considered this entry to have this space so i found the center line here i took the center line from the hallway and extended it across into the larger common area i might want some lights in the hallway and then maybe i want them to continue the one thing you want to be sure to do is lay out your any recessed lighting that you might put in into a grid and try to align your fixtures with the architectural elements of the house either windows or doors use them as reference points and find center lines and then you can think about how you might want to light this kitchen here i have a center line over the kitchen island i know that i will have this is my workspace and i will put some under counter lighting under the cabinet excuse me under cabinet lighting under the wall cabinetry here and here but essentially this is my work triangle so i can use these four corners if i wanted this is the center line between the the island and the wall so i start to block out a what ends up being a very grid-like form and it helps me place lighting and wall you know ceiling outlets or j boxes or um what was that hvac i like things to line up so if i'm putting you know if i have air going airflow going into a space i would want you know airflow on the center over here we've lowered this ceiling area over here in the hallways and these closets so that we can run our hvac through there and we can come out into this space and out into this space so we have a lot and back into the bedroom so we have a lot of options but i again when i look at a wall i like to see things centered if at all possible so use your architectural elements and use your center lines of spaces and then to go from there to determine a proper uh placement for your lighting and your furniture as you can see i did place a queen size bed here it's very narrow through here but the access remains so i have good circulation coming into the space i can come into the bed i can come into a dresser or desk i can come into the room and go right to the closet or i have the minimum two feet to be able to walk around the bed so these are all the things that i'm thinking about i'm thinking about the bed when i'm placing my electrical and my lighting because i want a future someone whoever that is to have options in the space to put a bed where they'd like it and to have a lighting that will light up the entire space okay that's all that's all i wanted to say thank you for listening bye"

},

{

"VideoID": "937",

"Title": "#bluecollar #electrical #construction #diy #electricalwork #residential #sparky #viral #electrician",

"URL": "https://www.youtube.com/watch?v=UuXn3\_R53lY",

"Keyword": "Residential electrical construction",

"Transcript": "I get happier about the harder it is because I know that no one else will follow it's a selection effect and I think if you can if you can shift from this is hard to no one else will be able to do this then it it's it flips from being this thing that you're like oh poor me to oh poor everyone else who's going to have to try [Music]"

},

{

"VideoID": "939",

"Title": "#bluecollar #electrician #construction #electrical #electricalwork #residential #sparky #viral #diy",

"URL": "https://www.youtube.com/watch?v=nRi6sOH5S\_I",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] when you said I'm all in were you really Allin let me tell you what the cost of being Allin is early mornings late nights being misunderstood having very few friends being your own cherleader are you those things people always talk about man I'm a hard worker everybody in this room is hard work that's not going to separate you from anybody else what are you working hard on people always look for one thing for the other oh you know you got to work smarter and not harder no you got to work smarter and you got to work harder work"

},

{

"VideoID": "941",

"Title": "#bluecollar #electrical #construction #electricalwork #sparky #viral #electrician #residential #diy",

"URL": "https://www.youtube.com/watch?v=S3TYI7YpNHI",

"Keyword": "Residential electrical construction",

"Transcript": "how does this turn it to into pieces this"

},

{

"VideoID": "944",

"Title": "Electricians are the best! #electrical #wiring #residential #construction #sparky #work",

"URL": "https://www.youtube.com/watch?v=QH5rSAYDGXc",

"Keyword": "Residential electrical construction",

"Transcript": "oh we were just making fun of the electricians what pride month are you trying to get us canceled no I didn't say anything about their sexuality it doesn't matter oh damn here they come hey guys great job today love what y'all are doing out there electricians are the best"

},

{

"VideoID": "945",

"Title": "Residential Interior Design Series: Electrical Conduit Plan",

"URL": "https://www.youtube.com/watch?v=oFpd0v7kBYU",

"Keyword": "Residential electrical construction",

"Transcript": "hey friends welcome back to the channel wishing everyone a very very happy new year my name is ricky doshi and i'm an architect and interior designer based out of mumbai in the last video we spoke about the pre-civil conditions and how to make a plumbing plan and what information needs to be on it so that the plumber can go about with the execution of laying the pipes today's video will be a continuation of the previous one where we'll talk about how to design an electrical conduit plan and how to place the switchboards in the plan and what information needs to be on this plan so that the electrician can go about with the execution process so what is an electrical conduit an electrical conduit is a tube that is used to protect and route the electrical wiring within a structure they may be made of various materials such as metal plastic or fiber for demonstration of how to design an electrical circuit plan i shall be taking the same furniture plan that i've been using all along in the previous videos firstly we need to identify the location of switchboards based on the furniture plan the position of switchboards is given in a way that creates an ease of usage based on the furniture placements the height of the switchboard is determined as per the ergonomic data that considers the human body dimensions as an important factor there are two basic switchboard heights that are given in general practice the first one is around 33 inches where one has to use the switches while in a seating or a sleeping position the other one is around 54 inches where one has to use the switches while in a standing position these dimensions might change depending on the ergonomics and the requirement of each individuals once the switchboards have been identified we need to place the main distribution board or mdb where the main electrical cable wiring line of the building enters your apartment the location of the mdb is of utmost importance because it needs to be strategically placed so that we can achieve an efficient wiring layout from the mdb we need to lay the electrical conduits to every switchboard as mentioned earlier these conduits act as a protective layer for the actual wire and also help in routing the electrical wire to their destination as shown in this plan we can loop the conduits when switchboards are close to each other this helps in decluttering the conduit pipes at the ndb also it is an efficient way of design we need to lay the different grades and thicknesses of the electrical wires the most common practice for residential housing is 1.5 square mm copper wire for basic lighting 2.5 square mm copper wires for heavier electrical loads such as refrigerator dishwasher washer and dryer etc and lastly the four square mm cable wires for hvac purposes once the plan is ready the electrician can execute the laying of the conduit pipes on the site as per the drawings here are some reference images of conduit pipes of different materials this is a gi conduit pipe this is a pvc conduit pipe and this is a fiber conduit pipe also here are a few images of how the conduiting process takes place on the site i hope this video helped you understand how to go about the conduiting process and what information needs to be on the conduit plans so that we can achieve an efficient execution process if you liked what you saw please click the like button and do share this video with your friends families and acquaintances this helps me to reach out to a larger audience also do subscribe to my channel if you haven't already done so and please click on the bell icon so that you get a notification every time i post a new video on youtube once again thank you all for supporting my channel until the next video stay healthy stay safe"

},

{

"VideoID": "946",

"Title": "Did you know the difference? #electrical #construction #shocking #funny",

"URL": "https://www.youtube.com/watch?v=-iX9d7B9zgA",

"Keyword": "Residential electrical construction",

"Transcript": "all right raise your hand if you've ever been electrocuted put your hand down you've never been electrocuted you may have been shocked you may have been Zapped you may have been bit but if you're watching this video you've never died from electricity know your terminology so you don't sound like a noob [Music]"

},

{

"VideoID": "949",

"Title": "200A Home service (part 1)#work #residential #construction #youtubeshorts #electrical #sparky #short",

"URL": "https://www.youtube.com/watch?v=PCllRg012us",

"Keyword": "Residential electrical construction",

"Transcript": "so here's how I install an overhead home service in them first I start off by Roamer hammering three holes for the disconnect then I installed three red anchors for the disconnect to mount onto then I proceed by mounting my disconnect to the wall making sure that the red anchors line up with the holes on the disconnect then I give it a few love Taps for the disconnect to mount straight I installed three 5 16 head 10 by twos to fasten the disconnect to the wall and yes I make sure it is level I proceed by making a two inch knockout for my offset nipple I put my officer nipple and then rotor Hammer the holes for the meter can put my red anchors just like I did for the disconnect on this one I did six screws because this one will be carrying the weight of the overhead I personally think that it turned out looking great I like the look of meter cans and disconnects on brick homes it looks nice I will be posting the second part because this is kind of a long project to record and put it on in under a minute since YouTube doesn't let you well thank you guys and I'll see you next time if you'd like to see check in the description"

},

{

"VideoID": "951",

"Title": "Interior Metal Wall Framing, Plumbing, Mechanical and Electrical Installation in South Florida.",

"URL": "https://www.youtube.com/watch?v=suTfdX4mcWY",

"Keyword": "Residential electrical construction",

"Transcript": "with the shell complete we're going inside our two-story masonry house to build out the interior come along as we install the interior framing mechanical electrical and plumbing at our build-a house project in South Florida the contractor selected the use of metal studs to create the interior wall partitions but let's start from the [Music] top the building plans help installers frame out the partitions on the concrete foundation each room is laid out and with luck the plumbing and electrical piping installed during the foundation pour line up with the walls which wasn't always the case metal stud bottom trucks are secured to the concrete foundation by shooting Drive pins with 22 gauge power actuated Fasteners air guns secure pressure cheated wood framing studs against exterior masonry walls [Applause] [Music] vertical studs are secured to the top and bottom tracks with metal screws this is all done for the building plans and are inspected by City officials prior to continue metal studs are placed alongside wood roof trusses for a level ceiling finish and to frame out tray ceilings architectural features like this electric fireplace wall are framed out which also helps hide columns that didn't lie Center to the [Music] wall wood blocking is added to metal studs to provide stiffness and laser levels help keep everything level and [Music] plump wood door openings are framed in to help stiffen and secure door installation and when are frame to provide support for drywall [Music] ends the same work continues upstairs attaching Floor tracks to the plywood Framing and wood trust is above but there's a problem this door location was changed and not caught during installation [Music] framers quickly remove and relocate the door easy when it's just framing but difficult to do afterwards with the framing complete Plumbing can be installed hot and cold water Force Mains and drain lines are constructed through the walls and Floors at the plumbing fixtures noted on the plants another problem arises there's a break in the water line which was identified and required the slab to be cut so the pipe can be properly reinstalled to ensure no leaking occurs in the future showers are formed with wood curbs and lined with felt paper they will be formed with concrete then overlaid with shower pants and finished with tile this shower diverter is installed to provide the hot water cold mix PVC pipes are fitted cleaned leveled and glued in place before walls can be finished [Music] finished piping is pressure tested to pass inspection with the plumbing underway the air conditioning ducts are installed in and around roof and wall framing both send and return lines are installed to provide a uniform cooling process throughout the house [Music] Air Handlers are tucked under stairs and similar Hideway [Music] areas air conditioning components will also hang here from the garage from chains so it's up and out of the way but accessible for maintenance next is electrical each wire to the outlets switches and ceiling light is routed through the circuit breaker panel and through pre-cut holes in the metal framing to their final destinations throughout the house [Music] positive negative neutral and ground wires are terminated and await final switch or Outlet installation after walls are finished the wires end up at circuit breaker panels awaiting final connection it looks messy but there's a logical method to [Music] installation with the plumbing AC and electrical rough work in place drywall is delivered awaiting approval to to be installed that's an entertaining process you won't want to miss find more episodes at engineering plans.com sbuild [Music]"

},

{

"VideoID": "953",

"Title": "#bluecollar #electrician #construction #electricalwork #residential #sparky #viral #diy #elactrical",

"URL": "https://www.youtube.com/watch?v=RXEWl9CGjNg",

"Keyword": "Residential electrical construction",

"Transcript": "H yeah look at this Bro clean ass highight homie all homie fuing Bas all inchas homie look at this dog cakes for days my boy check this out"

},

{

"VideoID": "954",

"Title": "4-GANG MAKE UP! The Lady Electrician♥️ #shorts #electrical #residential #newconstruction #wire",

"URL": "https://www.youtube.com/watch?v=\_J3s61FNZFU",

"Keyword": "Residential electrical construction",

"Transcript": "foreign [Music]"

},

{

"VideoID": "955",

"Title": "Residential Electrical Contractors Knoxville TN|Knoxville Electrician - Foster Electric|865-246-7037",

"URL": "https://www.youtube.com/watch?v=44MYFyOmaHI",

"Keyword": "Residential electrical construction",

"Transcript": "residential electrical contractors knoxville tennessee foster electric provides residential electrical services in knoxville tennessee we are electricians specializing in residential panel inspection wiring repair ceiling fan setup electrical installation and lighting fixture installations we provide straightforward pricing to fit your budget and the fact that we have friendly and professional electricians makes us a good choice as well if you have an old house that requires electrical service or a new home that needs it we are there for you we serve the entire tennessee area call us today at 865-246-7037 for free estimate"

},

{

"VideoID": "958",

"Title": "home runs The Lady Electrician ♥️ #electrical #newconstruction #shorts #residential #wire",

"URL": "https://www.youtube.com/watch?v=rc02b5jbg-M",

"Keyword": "Residential electrical construction",

"Transcript": "hey hey i'm on vacation every single day cause i love my occupation hey i'm on vacation if you don't like your life then you should go and change it"

},

{

"VideoID": "959",

"Title": "RESIDENTIAL ELECTRICAL TRIM OUT #like #subscribe #youtube #electrical #customhome #shorts #",

"URL": "https://www.youtube.com/watch?v=ik6i8mfM8Cg",

"Keyword": "Residential electrical construction",

"Transcript": "[Applause] [Music] you"

},

{

"VideoID": "961",

"Title": "2024 House Electrical Wiring Work Material &amp; Labor Cost |House wiring electrical point rates",

"URL": "https://www.youtube.com/watch?v=imBsRLcvhOY",

"Keyword": "Residential electrical construction",

"Transcript": "house wiring electrical Point rates September 2023 light Point rupees 200 fan Point rupees 195 two-way light Point rupees 265 2-way fan Point rupees 270 Bell Point rupees 195 get light Point rupees 360. 6 amps switch plus socket rupees 230 16 amps switch plus socket rupees 265 AC circuit with Point rupees thousand three hundred water heater circuit with Point rupees 1400 lighting circuit rupees 490 power circuit rupees 580 inverter circuit rupees 1800 single phase DB with MCB fixing rupees thousand three hundred three-phase DB with MCB fixing rupees 1800 single phase service line rupees 2000 three-phase service line rupees 3500 six feet Earth pipe rupees two thousand this rate will be applicable to City areas if you want PDF of this current electrical rates without any Watermark kindly check the description box given below if you like this video kindly subscribe civil engineering Shiloh's updates thank"

},

{

"VideoID": "964",

"Title": "THE CLEANEST ELECTRICAL RESIDENTIAL WORK. #oddlysatisfying",

"URL": "https://www.youtube.com/watch?v=PrJlFlL9I84",

"Keyword": "Residential electrical construction",

"Transcript": "must have used a laser level for the holes all the wires are supported correctly within code none of those so-called service Loops this is the way you're supposed to rough in a house it's the way I do it how about you"

},

{

"VideoID": "965",

"Title": "Devices boxes used in Residential Electrical Construction",

"URL": "https://www.youtube.com/watch?v=IsoN0LOS2rY",

"Keyword": "Residential electrical construction",

"Transcript": "hello everyone i am jan pero the electrical instructor here at the st john valley tech uh what i'd like to showcase today is the different type of electrical boxes we use in the electrical field starting with the most common that we use in a residential home with wood framing is the nail on box they come with the nails mounted right on the box itself so you simply just have to measure where you need the box and nail them in place also one thing to note about them is they have tabs on the side to gauge where you want to be they have this tab set at half inch for either half inch sheet rock or a half inch piece of plywood however they are finishing their walls if need be you measure with the tape measure what you need for distance from the surface of that where you're going off of and you can nail it into place over the years they've innovated these boxes to now having these adjustable boxes which work very well with especially in the case of people in their houses remodeling their kitchens and they're adding backsplashes to the kitchens you simply just either back off the screw or set it in so that the surface of this box is flush with the surface uh of the wall of the outer coating so in certain areas of the country uh codes require them to use metal boxes for the interior of the home so we also have these steel boxes that can be screwed or nailed on a stud you also have to figure your depth engaged same way with the surface of the material that's being on the outside of your walls in the case of having a metal box the box has to be grounded i took one of these grounding a piece of ground wire with the green grounding screw bonding into the box which you bond to the devices that you're installing in these boxes also they have we use these octagon boxes for ceiling fans light fixtures sconce lights and anything that's needs to be rated to be hung from a ceiling you'll be using one of these boxes has a bracket on the side um so those are the typical boxes you'll see inside a residential home uh after the fact if you have to do old work which that's what these boxes are called our old work boxes you'd be cutting these into either sheetrock aspenite whatever you have if you're you'll be adding a receptacle or a light inside of those walls so these are the all you have to do is simply they have these screws on the side these are tightened in place right now so you back off the screw [Music] so as you can see these boxes have these tabs on the side that once you tighten them in they push the tab towards the box so the surface that you are tightening to so you just you cut your hole out you pop them in just run your wires before you stick your box in same thing with the round boxes in some cases these boxes don't work because you have a thicker material behind it so those tabs don't aren't able to catch that material so we'll use these steel wall cases the steel wall cases have these tabs or these ears on the top and bottom that way you can either put a sheetrock nail or screw through the surface and into the material that way it's secure you can secure it in place same thing metal boxes have to be bonded and grounded to your device into the electrical system another way you can attach the uh steel wall cases to uh especially sheetrock or aspenite as we have these clips these clips are typically called either sheetrock clamps uh madison clips or i've also heard them called battleships from how they look uh for these you simply just pop these into place you get your box inside the wall and then when you look there's a screw on the boxes so you have on a box like this you have these screws right here that will stick out it's a little dimple inside side of the box so that's the side uh you're going to have the shorter end of that clip going to so it's the opposite side of the screws where the longer tab is going to go in and that's going to simply slide right behind you go up i am going to have another video coming up too on how to properly install those clips but that's just another way of securing those boxes to the wall pieces we have these other boxes the 4x4 steel commonly used for junctions you'll see these in the attics in the basements same deal it's a steel box it's got to be grounded you'll have these handy boxes you see typically in a smaller area if you don't have a lot of room you'll use these for a junction hence the name handybox uh also these are weatherproof boxes what we'll be using for outside uh junctions receptacles um and you'll come in these are weather type boxes uh i don't have the cover on it but they'll have a sealed and approved listed cover over these boxes so thank you all for checking out this video education is key especially in this field so hopefully you guys can tune in for more videos just like and subscribe to the page for more great information"

},

{

"VideoID": "966",

"Title": "Is the Nail Gun Cheating in Residential work ? 😂 #electrician #electrical #construction #tools",

"URL": "https://www.youtube.com/watch?v=qGT6JqwMnFU",

"Keyword": "Residential electrical construction",

"Transcript": "got the Square D panel okay okay man I I much prefer using the two- screw connectors even for landing your Rox as opposed to the plastic popins those things are junk oh he cheating he cheating or she cheating either way Che clean work though"

},

{

"VideoID": "968",

"Title": "#bluecollar #electrician #construction #electrical #electricalwork #residential #sparky #viral #diy",

"URL": "https://www.youtube.com/watch?v=mD-aaRF22HM",

"Keyword": "Residential electrical construction",

"Transcript": "if you want to stop me you're gonna have to [ \_\_ ] kill me [ \_\_ ] now you duck when I say I got the Sho this baby"

},

{

"VideoID": "969",

"Title": "#bluecollar #electrician #construction #electricalwork #residential #sparky #viral #diy #tradesman",

"URL": "https://www.youtube.com/watch?v=8ZkYVrCIdZM",

"Keyword": "Residential electrical construction",

"Transcript": "when do you think you're the coolest guy in the parking lot and then this guy shows [Music] up back"

},

{

"VideoID": "972",

"Title": "Can you do better? #electrician #electrical #residential #switch #sparky #shorts #construction #diy",

"URL": "https://www.youtube.com/watch?v=ICgAUgH83ck",

"Keyword": "Residential electrical construction",

"Transcript": "can you do better [Music] [Music]"

},

{

"VideoID": "973",

"Title": "#bluecollar #electrician #construction #electricial #plumbing #electricalwork #residential #sparky",

"URL": "https://www.youtube.com/watch?v=W1xMvGSglhs",

"Keyword": "Residential electrical construction",

"Transcript": "Proverbs 13:24 says the soul of the lazy man desires and has nothing but the soul of the diligent shall be made Rich the lazy man desires what hardworking people want house food vacations money for college and retirement but the Lazy Man's desires remain unsatisfied while the diligent gain wealth if you continue to be lazy you will always be unsatisfied and Chase what the diligent man has but if you become diligent you will have wealth God says a lazy life is an empty life but early to rise gets the job done a lazy person's wealth will always be a dream never reality if you are lazy you will never find satisfaction in or life"

},

{

"VideoID": "977",

"Title": "New home Electrical service (part 2) #shorts #electrical #residential #newhome",

"URL": "https://www.youtube.com/watch?v=aLrBGW1DswM",

"Keyword": "Residential electrical construction",

"Transcript": "this is part two of an overhead home service if you haven't seen part one please make sure to go to the subscriptions and check that out so I started off by cutting out the shingles with my utility knife but at the end I just said screw it I kind of did the hole too small with the utility knife and I did with my Sawzall blade it was already kind of dull anyways um this part is pretty self-explanatory I just cut out a hole in a square shape for the mask kit to fit in there properly and then I put my pipe in to make sure everything is going to fit correctly I pulled a conduit back out and I cut more of the roofing because it didn't fit after that I installed a two inch standoff strap because the conduit was not right up against the wall I had a hard time screwing the conduit to the hub so I ended up undoing the Hub from the meter can and screwing it on by hand finish it off with channel locks I do not have the main breaker for the disconnect so I ended up having to go to the shop later on that day and doing it and if you guys really like this video please make sure to subscribe like comment it really helps me out in the future to make more content for you guys"

},

{

"VideoID": "979",

"Title": "Residential Construction - Workplace Electrical Safety",

"URL": "https://www.youtube.com/watch?v=sIiTxeKrgCs",

"Keyword": "Residential electrical construction",

"Transcript": "before starting any job it's important to always look up to make sure you know where the power lines are located in the area it's your responsibility to be aware of surrounding power lines and to alert others of their danger whether your crew is working on the roof trimming trees cleaning gutters or painting the siding of a house you should always stay at least 10 feet away from overhead power lines and anything in contact with them for safe measure you should always carry long equipment such as a ladder horizontally to avoid accidentally bumping into overhead power lines if you see a downed power line just stay away and call 9-1-1 and remember to avoid accidents in the first place always look up in always safety is smart prevention is power [Music] [Applause] [Music]"

},

{

"VideoID": "980",

"Title": "Mechanical, Electrical and Plumbing on CLT Home",

"URL": "https://www.youtube.com/watch?v=VbR0Px6KMtw",

"Keyword": "Residential electrical construction",

"Transcript": "So we're standing in front of a new place \nwe just put up that you saw run through   our factory this is a around 1100 square \nfoot Bungalow, 2 bedroom, 2 bathroom with   a nice open space facing the Gatineau River \nso we're gonna have a little tour of today. So you just saw this building go through our \nfactory now we're just finished assembly and   finished our rough-in for our mechanical. \nSo today we're going to highlight a lot of   different features and explain how we run our \nelectrical, plumbing throughout this space. So here's a good example of some of our \nelectrical that comes up out of the slab.   So we have all these conduit. It's a coraline \nconduit that we use to run through the slab and   to the utility room or to an interior wall where \nthat switch or plug is going to be controlled.   In this case we have a much wider opening with a \nnumerous amount of conduits because this is a an   office corner so we have a larger box with some \nnetworking. As well that's going to go in later   but we also have this channel that comes up to \na light switch box above here now we can drill   anything that's typically around 18 inches up as \nsoon as we get to a counter height or a switch   height. What we do and what we did specifically in \nthis project is when the panels are on a flat side   within the facility we'll actually core out the \nback side and integrate a spline and put a piece   of plywood back in to create our air tightness \nand that gives us a chase on the back side all   the way up so that we are are able to run that \nelectrical from top to bottom. And that's one   of the ways we can get away with running wiring \nand not interrupting our nice finished surface So this is going to be our kitchen, as you see \nhere these boxes are actually set for tile this   is going to be the backsplash and we have a tile \nbacksplash so these boxes are actually purposely   set outwards in order to receive the tile so \nthat it's flush. You can see the stove plug is   already cored out of the actual panel as well. \nComing along to our plumbing. Generally within   our concrete slab on grade it's very typical to \nhave all your plumbing installed ahead of time and   that's the same case here we're just integrating \nit up and close to our wall system. Moving on to   something that is also a challenge within a \nCLT wall system is our actual HRV unit. So if   you look at the ceiling we have a drop ceiling and \nwe're able to run all our HRV through that utility   cavity. We create not only the utility for the \nHRV but also our plumbing vent and any electrical   wiring and pot light as you can see across the \nceiling here. We are in the mechanical room as   you can see we have all these electrical conduits \ncoming in underground we generally with majority   of our builds will bring in the all our electrical \nservice in underground, we have our water   from a well because we are rural, so we bring in \nwell water and here we can see our HRV system. We   have our intake and our output above here. We're \ngoing to have a Minotair unit that is a heat pump,   HRV, AC and heating all integrated into one \nmachine. So that is what's distributed throughout   the house. Minotair is a company actually not far \nfrom us just outside of Gatineau. Their unit is   something we use quite a bit in our buildings \ndue to the efficiency that we get and generally   the size of our buildings. It's a single and only \nunit we need for our mechanical. We do actually   pre-install our HRV system prior to building \nour sub cavity or our utility cavity giving the   contractor the freedom to run everything on the \nceiling prior to us putting all the framing in   his way. So it is something when we're doing \nthese cavities that we're keeping in mind to   make sure that each subtrade comes in and has the \nmost freedom as possible with certain limitations.   So that way we don't have to frame everything \naround them. That's the goal, is to give them   that opportunity to run anywhere below that cavity \nand then we'll install our framing after the fact.   So here we are in the master bath as you \nsee here we have a framed wall system up   on top of our CLT. This bathroom is going to \nbe tiled. Generally you wouldn't put exterior   plumbing on your exterior wall due to the risk \nof freezing. Because of our performance of our   losses and the zero thermal bridging that's \ncreated, there's actually no concern to have   this plumbing on our exterior wall. So for this \nspecific project it's a bungalow with a shed roof   we're very limited in terms of the mechanical. \nWhere we can position it. Generally we'll have   an open web floor joice in between stories in a \ndifferent type of building. So we have a bigger   advantage to run most of our mechanical. In \nthis building as you notice here all interior   partitions are out of standard 2x4 framing. The \nclient was very adamant about sound so you also   see the mineral wool within our cavity to reduce \nthe sound. So most of the time for simplicity   and mechanical in a CLT wall the exterior wall \nsystem is going to remain CLT yet the interior   walls if they turn into mechanical walls which \nin a house of this size every wall has enormous   amount of mechanical then it becomes very crucial \nto have that flexibility within a standard frame   system. There are options as well, it gets more \nchallenging to do all your interior partitions out   of CLT as well that takes an additional amount \nof planning in order to achieve that properly."

},

{

"VideoID": "983",

"Title": "New construction House Panel Service #electrician #bluecollar #electricial #electricity #residential",

"URL": "https://www.youtube.com/watch?v=R--D8YsobGo",

"Keyword": "Residential electrical construction",

"Transcript": "outp on Myers hey I a and got we canot relate the everybody like down we a being I still got some but I he the pain I it all and I might go ins I could risk it all and win for the [Music] [Music] with real estate I"

},

{

"VideoID": "984",

"Title": "Kinetic Electrical Contracting, Residential Construction, Grasonville, MD",

"URL": "https://www.youtube.com/watch?v=8U0hT8zJsyk",

"Keyword": "Residential electrical construction",

"Transcript": "are you looking for a qualified and trusted electrical contractor in either Staten Island or the surrounding area then it sounds like you're looking for the professionals at kinetic electrical contracting established back in 1988 we're the experts when it comes to all of your commercial and residential electrical needs equipped and ready to help you with everything from new construction alterations and renovations to repairs maintenance and whatever else your project may require and we're committed to providing each and every one of our clients with the very best electrical workmanship available but at a price they can afford 24-hour emergency services are available so there's never any reason for you to hesitate to contact us so what are you waiting for let our professionals get to work for you today kinetic electrical contracting call us or visit our website now"

},

{

"VideoID": "985",

"Title": "Soffit Lighting Installation - Residential Electrical Services #electricianvishal #shorts",

"URL": "https://www.youtube.com/watch?v=\_xBAZW4FFEQ",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] oal electric has installed new outdoor sofit lighting to boost safety and Aesthetics at this residential property benefits include improved security by Illuminating dark areas to deter Intruders enhanced curb appeal by highlighting architectural features safer navigation at night and Energy Efficiency with modern LED lights this setup also Fosters a well-lit environment for evening outdoor activities contact us today for residential sopit installation [Music]"

},

{

"VideoID": "987",

"Title": "￼Electrical 200 amp service feeders for residential custom Luxury home #electrical #sparky #panel",

"URL": "https://www.youtube.com/watch?v=MhGAy4PMnpM",

"Keyword": "Residential electrical construction",

"Transcript": "so today we're running service entrance feeder wires see they go up because there's an elevation change here to up high and then we got them supported up there with all threaded so they're not just hanging on anything it comes here it's the first one and that's the second one it's all the way down to the back side over there 200 amps a piece"

},

{

"VideoID": "989",

"Title": "Started a big one in Sedona! #electrical #bluecollar #electrician #residential #tradesman #sparky",

"URL": "https://www.youtube.com/watch?v=93nHbLbgHSM",

"Keyword": "Residential electrical construction",

"Transcript": "if you guys ever want to close somebody I'll give you one of my all-time favorites you tell somebody you guys do things three ways okay you do it fast you do it cheap and you do it good okay fast cheap and good and then you tell them you can have any of those two that you want pick which ones you want and they're going to say you know fast and good well then it won't be cheap they'll say Okay cheap and good okay then it won't be fast see what I'm saying I want it fast and I want it cheap well then it won't be good what are you looking for are you looking for something with value you are you looking to solve a problem or you looking for something fast and cheap why you cost more than the competitors the competitors don't include me the competitors aren't going to be here when ding ding ding ding happens and ding ding ding will happen and if you don't believe it happens here look at this article look at this article look at this article that happens in the industry I'm from this industry I'm looking to protect you if you spend a little bit more money and you got the job done wouldn't that be better than saving a little bit of money and having to do it two or three times"

},

{

"VideoID": "990",

"Title": "#electrical #residential #construction #youtubeshorts #shorts #drywall",

"URL": "https://www.youtube.com/watch?v=FWMFG63ZiQg",

"Keyword": "Residential electrical construction",

"Transcript": "in this video we're sending two pendants over an island because they were not centered correctly during a rough-in this happens to us very often because most of the time there were not provided we see measurements of the island sometimes the voter doesn't even know how big or how wide the island is going to be until he drywalls the house and he decides that here we are using two remodel boxes since uh the light fixtures that we're installing are probably like a pound or a pound and a half they're very light so that should be able to carry the weight of the fixtures ended up taking back down the remodel boxes cutting a little bit off the sides because a canopy couldn't cover it the capping EP was way too small it looked great at the end please make sure to subscribe like comment if you liked it and I'll see you guys next time"

},

{

"VideoID": "998",

"Title": "#bluecollar #electricalwork #electrical #electrican #diy #construction #sparky #residential #viral",

"URL": "https://www.youtube.com/watch?v=\_9GohxCNP8I",

"Keyword": "Residential electrical construction",

"Transcript": "you want to know why because they're not in it for the glory they're in it because they're good at [Music] it gu"

},

{

"VideoID": "1000",

"Title": "BEDROOM PROJECT #shorts #vacation #electrical #lights #home #electrician #residential #lakeview",

"URL": "https://www.youtube.com/watch?v=D2dZYJBdTJQ",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] [Music] thank you"

},

{

"VideoID": "1002",

"Title": "#bluecollar #electrical #electrician #electricalwork #diy #sparky #viral #residential #construction",

"URL": "https://www.youtube.com/watch?v=f3eXD2q13zs",

"Keyword": "Residential electrical construction",

"Transcript": "what do you do I just go from place to place and do what I do best What's that show up yeah you do do that well"

},

{

"VideoID": "1003",

"Title": "#electrician #electrical #sparky #electricalwork #bluecollar #residential #viral #bluecollar #diy",

"URL": "https://www.youtube.com/watch?v=FpY2WSoTx-E",

"Keyword": "Residential electrical construction",

"Transcript": "why do you want to know my hourly rate I want to know what where my $18,000 is going so does that mean if I do work Less hours I should charge you less yeah so if I go over those hours I should charge you more sure really yeah so it means if I just tell you it took me 4 months to work on it you will now owe me $36,000 but I could hire somebody else who would charge me the same rate but do it quicker so you value time over money then sure so here's the deal I work really fast I can come up with a logo but I'm being punished from me being efficient and really good you understand the logic doesn't work"

},

{

"VideoID": "1009",

"Title": "HG Electric - Agricultural, Commercial, Industrial and Residential Electrical Contractor",

"URL": "https://www.youtube.com/watch?v=aQQtdnjlnEo",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] and chemistry with HG electric in Rochester and Plainview Minnesota I've been electrician since 1979 and HG electric we are primarily Rochester area Plainview area because that's where Todd and I live we do some industrial work we do small commercials we do a lot of housing single-family dwellings and we do service upgrades and we do do some farm work and over the past two years we've done I believe about 15 solar installs also we also do a lot of LED retrofit just about a hundred percent of people will go with the LED lighting as an option when they're remodeling redoing a shopper we've done some in grocery stores in all sorts of different places and we are a member of the power partners group which helps us in manpower when we do pick up extra work that also has a group in there that helps us as contractors communicate with with these people so when we do need help and education and with that all our people do get good benefits and good pay and are trained properly the way you would want your electricians to be trained we also are involved with the Contractors Association which helps us as a smaller company get ideas from the bigger guys on how we should handle stuff being members of our partners has helped us in quite a few different ways it is it's us manpower when we need it and help and advice from the other contractors wrong everybody's friendly about it even though they are your competitors we do all work together so people get the jobs and that companies get the jobs that fit their size of company so everybody can do it and be happy with it yeah all of us that are involved with the power partners realize that that this is a good deal for the career of your employees and for as the contractors because you have good resources to intermingle with the other contractors get ideas and also just to let everybody know how somebody young is coming up being an electrician is a good career path and an honest living [Music]"

},

{

"VideoID": "1011",

"Title": "3-gang make up!! The Lady Electrician ♥️ #shorts #electrical #residential #newconstruction #switch",

"URL": "https://www.youtube.com/watch?v=3w-IwzdiSog",

"Keyword": "Residential electrical construction",

"Transcript": "you know for this place [Music]"

},

{

"VideoID": "1012",

"Title": "Rough Electrical Inspection [Residential/NEC &amp; CEC] - Part 1 OF 2",

"URL": "https://www.youtube.com/watch?v=LVUvvJTr0HI",

"Keyword": "Residential electrical construction",

"Transcript": "hey man what's up we're just completing the electrical work right now do you know of any resources that could help me out with this inspection wait hold on a second building code buddy online nice happy new year 2022. what a great time to get started on this first of four rough trades inspection so if you're new to the channel follow me and a special shout out to the channel subscribers i thank you for your interest support and for being a part of this journey this video will present a basic rough electrical inspection in a new single family dwelling the electrical cable shown in this video will be non-metallic sheeted cable which is the most widely used wiring method in residential construction non-metallic sheath cable wiring shall comply with the provisions of article 300 and 336 of the national electrical code plan the work thoroughly consult your local inspector for local regulations i will now start by going over general requirements which apply to all the rough electrical work regardless of the area installed let's do this generally if securing more than two cables on one staple be sure the staple is made for two or more cables most staples are not made for more than two cables and in this case using cable stackers is probably the best option verify that cables are secured within 12 inches of the outlet box and every four and a half feet thereafter the term outlet is often used interchangeably with a receptacle please note that by code definition they are two distinct objects this illustration shows an example of the two also verify that the cables are not stapled on edge and that the cables are secured without damage to the outer covering bends in non-metallic sheathed cable must be no less than five times the diameter of the cable board holes for electrical cables should be maintained no less than one and a quarter inches from the face of the framing members however where board holes are less than one and a quarter inch from the edge protection from nail or screw penetration must be provided by a steel plate or bushing that is a minimum 1 16 of an inch thick protection of cable also applies at notches and wood made to accommodate electrical cables but when notching framing be sure the structural integrity of the framing is not compromised as a result of the notching also verify that electrical cables installed parallel to joists rafters or studs are secured no less than one and a quarter inch from the face of the framing member and for this inspection all cables should be roughed in made out as in assuring that ground conductors are pigtailed in boxes and ensure neutral conductors are pigtailed on all three wire home runs all cable sheeting must extend at least a quarter inch into the box six inches of free conductor is required at each outlet box measured from the point in the box where it comes out and if the opening of the outlet box is less than eight inches in any dimension the conductor must extend three inches outside the opening verify that all metal boxes are grounded boxes for ceiling paddle fans must be marked by the manufacturer as suitable for sealing suspended fan support [Music] so be sure to check the outlet box for the maximum weight that can be supported by the outlet well it was a lot of fun presenting this information to you this concludes part one of two in part two i will go over electrical requirements within the dwelling and the exterior of the dwelling so stay tuned as we continue down this journey and please remember that these are basic requirements nevertheless we will continue to build from these basic fundamentals as questions arise and as codes change lastly always check with your local building department for their local amendments to the code until next time take care and stay awesome"

},

{

"VideoID": "1013",

"Title": "New Electrical Construction Los Angeles",

"URL": "https://www.youtube.com/watch?v=BmJtlo7pbxI",

"Keyword": "Residential electrical construction",

"Transcript": "Due to circumstances that are unique to new\nconstruction, many additional skills and experiences are required compared to residential electrical\nwork. Our technicians have the skills, experience, and resources required to complete all new\nconstruction jobs on time and to the satisfaction of customers and contractors. We are a fully\nlicensed electrical contracting company that has extensive experience in new construction.\nAs a results, our technicians will complete jobs quickly and efficiently while saving\nyour money and frustration."

},

{

"VideoID": "1014",

"Title": "3-gang make up! The Lady Electrician ♥️ #shorts #electrical #residential #newconstruction #switch",

"URL": "https://www.youtube.com/watch?v=xOXRkVG7VmM",

"Keyword": "Residential electrical construction",

"Transcript": "tonight [Music]"

},

{

"VideoID": "1016",

"Title": "Electrical Panel! #electrical #construction #electrician #residential #electricity #diy #perfection",

"URL": "https://www.youtube.com/watch?v=8aiPx8xNpW0",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] go [Music] nah [Music]"

},

{

"VideoID": "1017",

"Title": "HOW TO USE WAGOS 😘 The Lady Electrician ♥️ #wagos #electrical #residential #shorts #newconstruction",

"URL": "https://www.youtube.com/watch?v=yTDJk9i1aco",

"Keyword": "Residential electrical construction",

"Transcript": "foreign [Music]"

},

{

"VideoID": "1019",

"Title": "You must know this before installing one. #electrical #youtubeshorts #subscribe #shorts #residential",

"URL": "https://www.youtube.com/watch?v=SLTCXkVqRKM",

"Keyword": "Residential electrical construction",

"Transcript": "there's a lot of people that ask me about chandeliers how to install a chandelier and what they need first thing that you want to do when installing a chandelier is you want to make sure you have a metal box no plastic box that there is a box that you want to be looking for whenever you want to install a chandelier you usually have these in bedrooms where you install a ceiling fan or you would have it in many areas like living rooms or sometimes even dining room this is a plastic box if you see a plastic box like that you don't not want to hang a chandelier on it a box like this that also works because it's a metal box and even better is screwed right onto the studer you just got to make sure it's properly secured and it's screwed right into the stud if it only has one screw you want to put two they also get asked if you can install Chandelier on a box like this if you have this on your ceiling I would not recommend that is not rated for holding any light fixtures this helped you out please make sure to give me a thumbs up subscribe if you're not do have a chandelier video installation coming up pretty soon to show you guys because I do get asked a lot about this and I hope it helped you out if it did please give me some"

},

{

"VideoID": "1026",

"Title": "The types of services a residential electrical contractor can provide",

"URL": "https://www.youtube.com/watch?v=xYYEVXvVxv8",

"Keyword": "Residential electrical construction",

"Transcript": "a residential electrical contractor can provide a variety of important services to homeowners they can install or repair wiring in circuitry with proper training and certification troubleshoot electricity related issues and even inspect existing systems for necessary maintenance they have the expertise needed to safely work with high voltage applications in the home ensuring that all necessary precautions are taken for the benefit of their clients quality contractors will also be comfortable working with alternative energy sources such as solar or wind energy allowing households to take advantage of more sustainable methods to meet their energy needs with a skilled residential electrical contractor supporting a family's home needs families can rest easy knowing that all power related issues are being handled prudently for more information contact Knoxville electrician Foster Electric at 865-246-7037"

},

{

"VideoID": "1027",

"Title": "#electrician #bluecollar #electrical #residential #sparky #tradesman #viral #electricalwork #diy",

"URL": "https://www.youtube.com/watch?v=-OmlZNjKp7M",

"Keyword": "Residential electrical construction",

"Transcript": "I don't know who need to hear this but here it [ \_\_ ] go I'm trying to be great yeah great with a capital [ \_\_ ] G I ain't trying to be regular I ain't trying to be so so I ain't trying to be okay I ain't trying to be mediocre I'm trying to be great and if you ain't trying to be [ \_\_ ] great then that's your [ \_\_ ] business move right out my [ \_\_ ] way but if you trying to be great then we can be [ \_\_ ] great together you come right on over here get right on this [ \_\_ ] Great Train put your [ \_\_ ] seat Bel on and we can ride right on off the [ \_\_ ] greatness"

},

{

"VideoID": "1028",

"Title": "#electrical #bluecollar #electrician #residential #sparky #tradesman #diy #viral #electricalwork",

"URL": "https://www.youtube.com/watch?v=5klYir3d6Y4",

"Keyword": "Residential electrical construction",

"Transcript": "is that enough aluminum no we normally run aluminum unless the homeowners pay extra for the copper or it's a a circuit that typically we don't even stock for aluminum so anything that's going to require uh 50 amps and up we run copper so you have a 50 30 20 box here for RV so that's going to be copper um and then you see the two black home run up there those are for the AC's because um they are listed on the panel for copper conductors only so um yeah that's pretty much it 30 amps 102 is not too expensive 103 is not too expensive so there's really no point in running aluminum there but yeah that's that's [Music] why"

},

{

"VideoID": "1029",

"Title": "#electrical #work #commercial #residential #electrical #contractor #workhard #shorts #viral #video",

"URL": "https://www.youtube.com/watch?v=-1qZwGnqMro",

"Keyword": "Residential electrical construction",

"Transcript": "foreign [Music] [Music] [Music] [Applause] [Music] [Applause] foreign [Music]"

},

{

"VideoID": "1033",

"Title": "#construction #work #new #power #sparky #electrican #electrical #power #residential #residentevil",

"URL": "https://www.youtube.com/watch?v=GtmiWEjyZHU",

"Keyword": "Residential electrical construction",

"Transcript": "I take the break [Music] so what never yeah yeah yeah to get hard I Chas it day W yeah yeah yeah into this SK yeah cuz he's the one who taught [Applause] me where [Music] FL I forget More Night"

},

{

"VideoID": "1034",

"Title": "Residential Switch banks #electrical #electrician #wiring #construction #residential residenti",

"URL": "https://www.youtube.com/watch?v=PkL1CHZjtck",

"Keyword": "Residential electrical construction",

"Transcript": "that's yours Mr George I'm calling you because Jose and Alejandro went for lunch"

},

{

"VideoID": "1038",

"Title": "#bluecollar #electrician #electrical #construction #diy #electricalwork #residential #sparky #viral",

"URL": "https://www.youtube.com/watch?v=OD4kVguK0\_I",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] blue collar workers man you think we have it easy you look at our and like wow damn that's nice I wish I had something like that oh you got it so easy no the we don't bro you think blue collar workers got easy no they had to work for that they had to wake up non-stop every day time after time again work endless hours endless hours overtime nonstop hours away from family losing their friends leaving their wife children behind if they have them and you"

},

{

"VideoID": "1040",

"Title": "How to install lights over a kitchen island #shorts #electrical #residential #youtubeshorts #kitchen",

"URL": "https://www.youtube.com/watch?v=p-eHW5HaNbE",

"Keyword": "Residential electrical construction",

"Transcript": "hi there my name is John so I uploaded a video on YouTube a few weeks ago by my co-worker installing two pendants and centering them over an island correctly and I noticed that he didn't get as much views or likes as all the other videos that I've posted in the past so he was kind of bummed about it if you guys haven't seen it please make sure to go like comment if and if you're not subscribed please make sure to go subscribe link is in my bio anyways here I am doing something similar to what he was doing except that here I am not moving them I am installing them because they were not installed during the roughing process I left the junction box up in the attic because there was attic access over the island in the kitchen and here I installed one pancake and on the other side I installed a remodel box because the lights are just under a pound these lights are super easy to install so if you guys ever want to install something like this in your home don't be scared and don't let anyone tell you you can't because you can and remember please like comment share make sure to follow me back if you haven't and I'll see you guys next time"

},

{

"VideoID": "1043",

"Title": "#electrical #tradesman #bluecollar #electrician #residential #sparky #diy #viral #comedy #trump",

"URL": "https://www.youtube.com/watch?v=bb5jBf08gCw",

"Keyword": "Residential electrical construction",

"Transcript": "customers ask you how long is it going to take this is what you say if everything goes as planned it should take dot dot dot when I say dot dot dot I mean you're going to fill in the blank depending on what project it is it should take three to four hours but my number one priority is to give you a job I'm proud of so you need to just have that so memorized that you don't have to think about it someone says okay sounds great how long should it take every time you sit my number one priority is to give you a job I'm proud of they always open up to take your time I'm gonna be gone all day anyways that's why I'm here I want you to take your time and it all reverses to where you know your stress level goes down that's extremely important for people in your position where you're"

},

{

"VideoID": "1045",

"Title": "4-GANG make up! The Lady Electrician ♥️ #electrical #residential #shorts #newconstruction #wire",

"URL": "https://www.youtube.com/watch?v=3epMLHTZTOw",

"Keyword": "Residential electrical construction",

"Transcript": "you know what it's called I went downstairs okay just sent me a picture"

},

{

"VideoID": "1046",

"Title": "Electrical Construction Plans &amp; Layout Drawings: Sample House",

"URL": "https://www.youtube.com/watch?v=e-aF76Qsnsw",

"Keyword": "Residential electrical construction",

"Transcript": "electrical construction plans are detailed blueprints that outline the layout components and wiring systems of an electrical installation they are essential for electricians and contractors to ensure safe efficient and code compliant construction site development plans shown here are comprehensive blueprints that outline the proposed land use infrastructure and improvements for a specific site they serve as a guide for Architects engineers and planners during the development process ensuring that the project aligns with zoning regulations and environmental consideration key floor plans shown here are detailed diagrams that show the layout of a building or space including rooms walls doors windows and furniture placement they provide a visual representation of the structures design and are essential for Architects Builders and homeowners to understand the spatial Arrangement and functionality of a space architectural floor plans are detailed diagrams that show the layout of a building or space including rooms walls doors windows and furniture placement these plans are essential for Architects Builders and homeowners to understand the spatial Arrangement and functionality of a space they are typically created using specialized software and often include symbols and conventions to represent various architectural elements electrical floor plans are specific types of diagrams that show the placement of electrical outlets switches fixtures and wiring systems within a building these plans are essential for electricians to understand the electrical requirements of each room ensure proper wiring and grounding and comply with electrical codes they are typically created using specialized software and often includes symbols and conventions to represent various electrical components electrical wiring diagrams shown here are detailed drawings that show the interconnection of electrical components within a building they are essential for electricians during the construction of houses as they provide a visual representation of the wiring layout circuit paths and connection between various electrical devices these diagrams help ensure proper installation safety and compliance with electrical codes electrical service entrance load calculations sample of which is shown here are essential for determining the appropriate size of the main electrical service panel and the necessary capacity of the incoming power supply to a building this calculation involves estimating the total power demand of all electrical appliances lighting fixtures and equipment within the structure by accurately calculating the load you can ensure that the electrical system is adequately sized to handle the anticipated power requirements without overloading or causing safety hazard an electrical panel schedule sample of which is shown here is a detailed document that lists the various circuits Breakers and devices within an electrical panel it provides essential information for electricians and homeowners including the circuit number breaker size load capacity and the specific appliances or fixtures served by each circuit this schedule is crucial for troubleshooting electrical problems understanding the power distribution within the building and ensuring that the electrical system is operating safely and efficiently an electrical Appliance load schedule sample of which is shown here is a list of all the electrical appliances and devices within a building along with their power ratings in Watts or amps this schedule is helpful for estimating the total electrical load on the system identifying potential overloading issues and determining the appropriate size of the main electrical service panel by understanding the power consumption of each Appliance you can make informed decisions about Energy Efficiency and ensure that the electrical system is adequately equipped to handle the demand electrical symbols shown here are standardized graphical representations used in electrical construction plans and layouts to depict various electrical components and connections these symbols are essential for electricians engineers and Architects to understand and communicate the design and layout of electrical systems common electrical symbols include those for switches Outlets fixtures wires grounding and other electrical Elements by using these symbols technical professionals can create clear concise and easily understandable electrical drawings"

},

{

"VideoID": "1047",

"Title": "Residential Electrical Panel Wiring | Step-by-Step Guide",

"URL": "https://www.youtube.com/watch?v=oBWCs\_hDU9Y",

"Keyword": "Residential electrical construction",

"Transcript": "Hey, welcome back to my channel! In \ntoday's video, we're diving into a   DIY renovation project where I'm handling \nthe electrical work. This video focuses on   how I wired and configured the \nelectrical panel. Let's flip the camera,   and I'll show you how I \nset up my electrical panel. Just to clarify, these two wires you see here \nare providing temporary power for the lighting.   Currently, there's no service connected \nyet. Let me explain that the neutral wire   is separate from the grounding, and proper \nbonding is done at the meter. I've added these   ground bars here, separating the grounds and the \nneutral from the lines going into the breaker. I'll be working on the apartment upstairs in this \ntwo-apartment complex. I've already completed   the first apartment, installing \nlighting, receptacles, and powering up   the entire space. Now, let's head to \nthe second floor, where I'll configure   the electrical panel. You'll get an \nup-close look at how I put it all together. Alright, guys, we're in the second-floor \napartment, and this is the electrical   panel we'll be working on. I've \nalready installed all the wiring   into connectors and the electrical panel, \nand I've also stripped all the wiring. Our first task is to install this Ground Bar \ninto the panel. This is a square Ground Bar,   and this is a Square D HomeLine Edition panel. \nThe key is to align these slots correctly. There we go! Now, we need to rearrange all the grounds to \nfit neatly without interfering with other wires. I also like to make a little \nbend in the wire for future   adjustments and to avoid cutting it too short. I'll insert it into the first group and tie it up. Each ground will have its own screw to prevent \noverlapping. The same goes for the neutral wires. After organizing the grounds, I \nuse zip ties to secure them. This   prevents ground wires from touching \nthe neutral bar or other conductors. Now, I'm going to repeat the process with the   neutral wires. I've finished organizing all the neutrals \nand grounds, and now it's time to   install the breakers and label them. I use a piece of cardboard and a marker to assign   names to each breaker, such as 'kitchen' or   'living room outlets.' This is my process, and it's essential \nto ensure a safe and organized electrical   panel. Thanks for watching, and remember,   if you have a similar project, consider \nhiring a qualified electrician. Stay safe!\""

},

{

"VideoID": "1049",

"Title": "This is my nightmare!!! #electrician #construction #work #lightbulb #home #homedecor",

"URL": "https://www.youtube.com/watch?v=c85vxdmt1Lw",

"Keyword": "Residential electrical construction",

"Transcript": "I just want to know who in the right mind when choosing a model for a house says yes I would like the one with the 30-foot ceilings so that way I have to rent a crane every time I want to change a"

},

{

"VideoID": "1051",

"Title": "Universal Electric &amp; General Construction Professional Residential Electrician Service",

"URL": "https://www.youtube.com/watch?v=mPe6nqN88e8",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] [Music] [Music] [Music] [Music]"

},

{

"VideoID": "1052",

"Title": "A Common Residential Electrical Code Violation",

"URL": "https://www.youtube.com/watch?v=OE6uOTPNc-M",

"Keyword": "Residential electrical construction",

"Transcript": "all right this one Automotive PPG and I am doing an electrical final brand new home looking at a master bath tub it's pretty nice little bathtub uh the issue is that light fixture a light fixture cannot be in that spot there's a zone eight foot up vertically from the edge of that tub three feet out horizontally from the edge of that tub cannot have a light fixture it can be flush up to the ceiling but it cannot be in that that area there and in addition to that violation that particular Outlet you see to the right of that bathtub is too close to that particular bathtub you need a three foot clearance that's new for 2020 NEC [Music]"

},

{

"VideoID": "1053",

"Title": "🫡🤌🏻🫱🏻‍🫲🏽 #electrical #electrician #sparky #residential #electrical #bluecollar #tradesman",

"URL": "https://www.youtube.com/watch?v=-z-iU1jA5B0",

"Keyword": "Residential electrical construction",

"Transcript": "you know the difference between an amateur and a [Music] professional a amateur does it so they get it right a professional does it till they can't get it wrong Hollywood C"

},

{

"VideoID": "1058",

"Title": "What is going on?!?! #construction #electrical #electrician #residential",

"URL": "https://www.youtube.com/watch?v=LkSBRTj9hl4",

"Keyword": "Residential electrical construction",

"Transcript": "got an update so that switch both of those wires are hot when the power's on which I cut that switch out of that box cuz it's oh it's broken needed replaced but when I checked both of these had power coming in so now I've come up here started messing around in here and this is an old Rat's Nest you ain't supposed to use that stuff no more it's just turning to dust let's tear into it"

},

{

"VideoID": "1061",

"Title": "Electricians also need to know a bit of builder skill. #electrician #electricalcontractor",

"URL": "https://www.youtube.com/watch?v=cvop70SnKAA",

"Keyword": "Residential electrical construction",

"Transcript": "electricians also need to know a bit of Builder skill after cutting grooves in the wall and finishing the installation of electrical conduits we have to repair the grooves we made as you can see to become an electrician and plumber in Vietnam you need to master a lot of skills I'm not boasting but to get projects from construction contractors we are required to learn these skills in my country electrical and plumbing work are combined and especially we don't need formal Dees High experience and good work ethics are enough to secure residential construction projects compared to Western countries like the US and European nations where they have to spend thousands of hours to become electricians"

},

{

"VideoID": "1070",

"Title": "Residential Electrical Services",

"URL": "https://www.youtube.com/watch?v=aWmXqHhHz5Q",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] Kizer has just been one of our team members for 22 years they send out good quality guys that are real friendly the training process that they put all these guys through is amazing they stay late to give me a cleaner product than when they got there as you come in here you can see how their business has grown and evolved and just the professionalism as you walk into this office I mean it just States the fact they're doing something right the people that are here is what makes that work so well I can't say enough good things about this company it's been a wonderful relationship for the past 12 years as we have helped each other to come back [Music] you [Music]"

},

{

"VideoID": "1071",

"Title": "Carmel Electrician | 831-275-0002 | Electrician Carmel Ca |Residential Electrical Contractors|93923",

"URL": "https://www.youtube.com/watch?v=ljl22HxSNQY",

"Keyword": "Residential electrical construction",

"Transcript": "it doesn't matter if you are an individual or a business if you have a large or small project finding the right electrician for your needs can be a challenge we always do professional and affordable work guaranteed to keep you safe and protected we get the job done with a quality from qualified professionals we pride ourselves on customer service call us for all of your electrical needs today"

},

{

"VideoID": "1072",

"Title": "Wiring 3 Bedroom house B.O.Q #residential #domestic Installation #engineering #construction",

"URL": "https://www.youtube.com/watch?v=MvC7OkdbJuM",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] thank you [Music] [Music] yes the construction company the same blood media images [Music] [Music] Roma [Music] foreign foreign foreign [Music] [Music] foreign [Music] foreign [Music] foreign foreign [Music] [Music] [Music] foreign [Music] [Music] foreign foreign [Music] [Music] foreign [Music] foreign America that is the material s foreign [Music] foreign [Music] foreign [Music] [Music] foreign foreign in December the construction is available at construction your number and construction company foreign foreign that is BO2 foreign see you next time bye bye [Music] thank you"

},

{

"VideoID": "1074",

"Title": "How to neatly land romex inside of a panel residential new code #electrical #electricalwork",

"URL": "https://www.youtube.com/watch?v=GF4\_f1LMRmQ",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] Let's Stay Together [Music] whatever you want to do [Music] is all right with me [Music] I want to spend my life with you the same thing baby since we've been together oh loving you forever [Music]"

},

{

"VideoID": "1077",

"Title": "Residential Electrical Contractor in Middle Tennessee | Thompson Electric | Lebanon, TN",

"URL": "https://www.youtube.com/watch?v=mk89f6zJuxM",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] our residential team can do projects such as hang a ceiling fan renovate your house if you're doing a a bigger project we wire up a lot of hot tubs a lot of swimming pools a lot of detach structures anything from Storage to art studios to you know actual recording studios it's pretty cool to see their Vision their their dream come to life we strive to do quality work so that we don't have to come back we strive to give a friendly family atmosphere so that they feel comfortable inviting us into their home and inviting us back into their home if they want some more work done the cleanliness of it is to make them feel like we were never there we love to call our residential customers uh you know a few days afterward just to make sure hey do we do a good job is there anything you wish we would have done differently can we fix that for you what can we do to make sure that you're 100% happy with the service that we offer [Music]"

},

{

"VideoID": "1078",

"Title": "Electrical students practice residential, commercial and industrial wiring projects 💡 #shorts",

"URL": "https://www.youtube.com/watch?v=TUdbZNjJD2M",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] oh oh oh"

},

{

"VideoID": "1079",

"Title": "Florida Electrical contractors licensing board- how it affects you.",

"URL": "https://www.youtube.com/watch?v=okzLYy8BEGY",

"Keyword": "Residential electrical construction",

"Transcript": "around [Music] [Music]"

},

{

"VideoID": "1080",

"Title": "#electrical #bluecollar #electrician #residential #sparky #tradesman #diy #viral #electricalwork",

"URL": "https://www.youtube.com/watch?v=TNqiFZDZq7Q",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] so I ball so hard want to find me but first got to find me what's 50 Grand to a like me can you please remind me ball so hard this crazy yall don't know that don't phase me the Nets could go zero for 82 and I look at you like this gravy ball so hard this weird we ain't even posed to be here ball so hard but since we here it's only right that we'd be fair psycho I'm liable to go Michael take your pick Jackson Tyson Jordan game six ball so hard got a broke clock Ries that don't Tick Tock otmar that's losing time hidden behind all these big rocks bball so hard I'm shocked too I'm supposed to be locked up too you escaped what I escaped you'd be in Paris getting up too bball so hard let's get faded Larice for like 6 days gold bottles scold models spilling Ace on my sick JS bball so hard behave just might let you meet yay chai towns D Rose I'm moving the net BK ball so hard want to find me that cray that"

},

{

"VideoID": "1088",

"Title": "(3) Residential Electrical Inspection Checklist Items #electrical #nec2020 #inspection",

"URL": "https://www.youtube.com/watch?v=TFNPZckGHXs",

"Keyword": "Residential electrical construction",

"Transcript": "all right this is Ronaldo Mo with PPG back with three quick electrical final tips you're doing an electrical Final on the residential I got three quick ones for you I am in the Attic uh you're looking at a mechanical unit heat pump when you are checking for your service outlet you have to make sure that that outlet is on a GFCI circuit and it's got to be on the same level or same plane can't be down in the habitable space must be up here in the Attic the laundry all the outlets in the laundry area and the kitchen area all the outlets must be on a afci and a GFCI circuit and the last one that AC disconnect right here cannot be directly behind a AC condenser you have to get that disconnect the same amount of clearance as you do an electrical panel"

},

{

"VideoID": "1090",

"Title": "😌🤌🏻 #electrical #tradesman #bluecollar #electrician #residential #sparky #diy #viral #comedy",

"URL": "https://www.youtube.com/watch?v=IWBtMqdo2zg",

"Keyword": "Residential electrical construction",

"Transcript": "oh yeah look at this bro clean ass Holly homie I'll people though homie Bolas homie look at this oh cakes for days my boy check this out fool George"

},

{

"VideoID": "1091",

"Title": "meter pack💪The Lady Electrician ♥️ #strugglebus #shorts #electrical #residential #sparky #vote #plug",

"URL": "https://www.youtube.com/watch?v=KbVD7PKfHEY",

"Keyword": "Residential electrical construction",

"Transcript": "go"

},

{

"VideoID": "1092",

"Title": "Is this ok!?! RESIDENTIAL ELECTRICAL? #homeinspector #diy #construction #electrician",

"URL": "https://www.youtube.com/watch?v=I8KNN1gtI54",

"Keyword": "Residential electrical construction",

"Transcript": "good morning everyone um this is definitely outside the scope of a home inspector so if you do not feel comfortable messing with electricity do not do it okay here's something you definitely don't want to do this house has aluminum Branch wiring and then they are wire nutting a copper ground wire to the aluminum wire to make it look like gets grounded um all kind of stuff going on here yeah not really good"

},

{

"VideoID": "1093",

"Title": "Residential Electrical Service Austin Texas",

"URL": "https://www.youtube.com/watch?v=f-7n8lzOmkA",

"Keyword": "Residential electrical construction",

"Transcript": "morning my name is mike i'm with hd electric uh today we're going to be talking about the uh these panels here we're looking at uh we're changing out a federal pacific panel these things are deemed by the industry standard not to be safe uh they they're considered fire hazards so if your house was built before 1990 i would take a look check it out you can look here on the face of the panel cover and right here you say federal pacific electric or sometimes they'll have it stamped with an fp on the cover and i would recommend getting an electrician to come out and change those in addition to checking the panel on the inside of the house your main distribution panel on the outside could also be federal pacific this particular one is not this this has already been swapped out at some point this is a fairly new panel it's not as old as the house so uh you check out by the meter where the panel is connected to the meter you"

},

{

"VideoID": "1094",

"Title": "Electrical plans - The EASY way",

"URL": "https://www.youtube.com/watch?v=h1Wd9M6AwVg",

"Keyword": "Residential electrical construction",

"Transcript": "today I'm going to be sharing my typical workflow for setting up an electrical and reflected ceiling plan in aryad this is a pretty basic residential project we're going to combine the two into one plan so let's kick off from the beginning starting off with our floor plan to get this to our electrical SL reflected ceiling plan there's just a little bit of boring setup stuff that we need to do but it won't take too long so let's get started all we need to do is set up a layer combination we'll go contrl L which will bring up our layers from here we'll just go new on the layer combination side we'll type in electrical plan we'll go okay and we're going to create a new layer which we're going to have all of our electrical and our switches and our Legend all of that on so let's call that electrical Legend example we'll go okay now we'll want to make sure that this layer shows up on our electrical plan so all we need to do is just make sure the IE icon is turned on and we've got the electrical plan selected and we go update so we'll go okay from here you'll want to bring in a legend which is going to show all the key components of our electrical and reflected ceiling plan from fans to lights to electrical power points if you don't have your own Legend I highly recommend yourfit architect data if we go to page 16 and 17 you'll see a lot of different examples of typical symbols that are used within the industry as well as a bunch of other interesting information so in this case once I've got it copied I want to turn it to the correct layer so I'm going to turn it to electrical Legend example that's going to hide those we'll keep on doing this until all of our elements disappear they're disappearing from our example because on the electrical plan I had set up before we haven't got the electrical Legend example layer turned on in the layer combination anyway we're almost through the boring setup stuff so from here we'll go back to our floor plan we're going to create a duplicate clicking and holding then tapping and holding in control and we'll drag that to our electrical plan to set up a folder you just click on this little icon just down here click on that and you can give it a file name we'll go Okay so we've got a duplicate of the plan set up in the view map from here we're going to want to right click go to view settings in your layer combinations we'll go to the one we set up just before which is our electrical plan we'll go okay and there we go so our Legend is just popped up but there's information that we don't want to show because it's going to be conflicting and drawing your attention away from the primary drawing which is just going to be those electrical and reflective ceiling plan details so let's get rid of the dimensions and the North Point we don't want to delete these because we still want them to show up on the floor plan so we just need to hold in alt for the r drop tool select control a which is going to select all of our Dimensions yep all of them are on the dimension layer so I'll just deselect let's go to contrl L which is going to bring up our layers and we're just going to turn off dimensions and we're going to go update so that's going to change our layer combination we'll go okay excellent that's turned off all of our Dimensions our North Point is on text so in this case that's going to work out for us as well because we're going to be turning off the text as well so what we'll just do go back into it we'll go go back into our layers turn off text and we'll go update and we'll go okay now from here whenever we go to our floor plan we've still got all of our Dimensions all of our text labels if we go back to our ground floor plan proposed it's all taken off so it's nice and clean we start with a clean slate so that it's even more subtle what we can do is we can take a fill let's make it 50% we'll turn it so that the pen is white and we've got transparent Set uh we're going to click over the top and from here we're going to select it and bring the display all the way to the front and we're just going to send it back just a couple of orders and we'll turn off the perimeter line just so that it kind of Grays out our floor plan just a little bit which is going to make our Legend elements stick out that little bit more so from here let's cover a couple of different rooms let's grabb the polyline and we're going to be using this as a reference line I'm just going to turn this to the Arad layer for now let's draw just on this edge of the wall just here I'm going to click and I'm going to go to the multiply tool on the pet pallet just down here then I'm going to go to distribute and then I'm going to go through and I'm going to make sure that minus one is clicked on it's it's going to make more sense in a second just watch the example it's going to be cool so we're going to click and drag all the way until we get to the wall let's do the same thing with this one here essentially what I'm doing I'm just dividing the room into four quadrants there we go 1 2 3 4 1 2 3 4 from here we're going to have lights evenly spaced so what we can do is we can just grab these from our Legend just make sure they're the grouped Control G I'm going to select it select it from the middle tap contrl just so that we create a duplicate and select it just into the middle of our grid line let's select that one duplicate across just to here let's select this one and duplicate both of those down to here and there we go so we've got our lights set up for this master bedroom just here let's struck in a ceiling fan as well so we'll grab this duplicate it on over and from here let's get some light switches so that we can turn on our lights so let's duplicate this flip it around I want to have two switches one for the lights and one for the fan so let's duplicate this as well now a very handy tool for actually creating paths from our switches to our elements is the spline tool so this one just up here we'll select this I want to click on our switch then click on our lights and then from here I'm just going to click at each of the center points and the blind tool is going to create a nice curve let's select let's finish the line by double clicking and from here I'm just going to want to turn this line into a thin Dash there we go all right let's clean this up a bit let's grab our grid that we just created before all of our lines just here and we'll go cut and we'll bring this down a layer I like to keep them just below just so that if I do want to bring the grid back up it's not too much of a hassle I don't have to redo the whole thing again so let's go back up a story uh by clicking control up and there we go so we've got essentially the reflected ceiling portion almost done now what I might do to make it a little bit easier to get this second line so it's not colliding with too many elements I'll just mirror these switches just here and then that way if I select this spline I click off this light switch just here I can have it curve into this fan just there these switches are just for indicative purposes and they'll represent a typical light switch which you're clicking on and off you'll see some with one 2 three and even four and more so we're not limited with how many switches that we can just have on one panel from here let's do the next easy one let's grab grab our double PowerPoint I've got these grouped so I'm just going to bring these over clicking control to duplicate and I'll just rotate this around let's create one either side on the bed just so that you've got electrical PowerPoints to be able to charge your phones and other accessories with I also like to create a couple more around the room just in case we've got other features like standing lamps or other stuff that we need charging all right let's see what else we've got in our Legend from here we've got fluorescent lights which if we grab those we can put these into the garage we're going to have these just above where the cars are you'd want these evenly spaced I'd do this in thirds doing a similar trick to what we did just before what I'll do I'll just grab this line here I'll create a guide then I'll go in through to the multiply tool let's go to two this going to create three segments for us there we go clicking and dragging across from here to get a Midway point I'm just going to create another guide reference just going to click in the middle and drag that across there excellent so I'm going to hover over the middle of our light and just bring that to the center and half of that 25 there we go do a similar type thing with this light just here one up and 25 down excellent I'll take my grid lines just here and this last little one here I'll cut it Go control down and paste it on the story just below and with that I've pretty much got my garage set up I'll just need to get the light switch I'll duplicate it over just here typically I try and have the switches within hands reach from the door just so you're not fumbling around in the dark all right let's grab our spline from before holding in the ey drop tool and then we'll just select on through to represent our ler through there oh now before we get too much further all of our lines appeared to be underneath that 50% fill so let's use the selection tool we'll just drag it over this section here just up here I'm going to select this by holding in alt which gives us our ey dropper tool I'll select the spline and from here I'll also add a criteria that it's going to be a certain pen type so I'll just type in pen double click pen and go plus that's going to select all those lines let's use the ey drop tool select it for circles which is going to select all of our circles and last but not least let's do it again using the ey droper tool to over our fill we'll select it and then we'll go click and that's going to select all of our fills last but not least the lines there we go let's go outside of here right click and go display order and bring to front there we go they're a bit clearer there now let's turn that back off so if we go undo we'll see that they're slightly FedEd and if we go redo we'll see they're much clearer being above that 50% fill one little trick I was taught when I was first learning how to do electrical plans was always to avoid having a light over the top of a fan if you have it over the top of a fan when the fan blades go past it's going create a strobing effect strobing which is like a light turning on and off really quickly so we try and make sure that we've got lights adequately distan from fans in any of the different rooms all right let's just go back through to our example all right if we just go back to our floor plan we'll notice that we haven't set our fill to the correct layer so it's going to be showing over at the top so let's select all the things that we didn't set up correctly to begin with and we'll select those to the electrical Legend example which is going to make those disappear any thing is we can do this after so not everything has to be perfect straight off the bat takes a bit of the pressure off each house is unique so from here you'll just need to go through applying each of the different elements to the rooms accordingly one other little thing to watch out for is cavity sliders you'll want to make sure that your lights are set on a wall where the cavity is in behind this is so that the cabling can go down through the back of the stud and the cavity isn't jamming up against the cords"

},

{

"VideoID": "1095",

"Title": "#bluecollar #residential #electrical #electrician #electricalwork #hvac #electriciantools #viral",

"URL": "https://www.youtube.com/watch?v=q1hH8oMsHlQ",

"Keyword": "Residential electrical construction",

"Transcript": "what's the average income of an electrician or plumber coming out of school this is the greatest thing they've now crossed $4 $50 an hour multiply that by 40 hours a week that's $2,000 a week before overtime that's $100,000 a year to control your own day to control your own schedule to control your own workload to control your input and your output and obviously ultimately your financial gain"

},

{

"VideoID": "1097",

"Title": "Is the wall made of bricks with mortar? #electrician #electricalcontractor #construction",

"URL": "https://www.youtube.com/watch?v=R2SVLZTGcB0",

"Keyword": "Residential electrical construction",

"Transcript": "is the wall made of bricks with mortar or is it made of a different material because your cutting blade goes so deep and I can't see any bricks is it made of concrete oh that's a very interesting question from someone who watched the previous video where I was cutting grooves for electrical conduits first to build a wall the builders will lay the bricks first and then they will apply mortar because the mortar layer is quite thick sometimes the cutting blade doesn't reach the bricks this is a residential house so no one would build a wall out of concrete if you notice there are are exposed bricks at the bottom of this wall and when I cut into it there will be red dust"

},

{

"VideoID": "1100",

"Title": "#electrical#work #residential #commercial #workhard #electrical #contractor #shorts",

"URL": "https://www.youtube.com/watch?v=SlGFgKxjVMg",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] I just wanna have a good night [Music] [Music]"

},

{

"VideoID": "1101",

"Title": "Electrical Residential (Circuit D1)",

"URL": "https://www.youtube.com/watch?v=tRvOYn857FU",

"Keyword": "Residential electrical construction",

"Transcript": "I'm doing circuit D1 all right what's up this is a light that is controlled by this has three switches to an S4 and that's three feet is coming into a light that's what's different from the other circuits that I have down there"

},

{

"VideoID": "1108",

"Title": "#Mirzapur#farmhouse #electrical #work #residential #commercial #shorts #viral #video #electricalwork",

"URL": "https://www.youtube.com/watch?v=JlLGjgQ4PYw",

"Keyword": "Residential electrical construction",

"Transcript": "foreign [Music] [Music]"

},

{

"VideoID": "1109",

"Title": "residential electrical contractors in Greenfield IA: Home Power Woes?",

"URL": "https://www.youtube.com/watch?v=w7H\_QQfeFVw",

"Keyword": "Residential electrical construction",

"Transcript": "residential electrical contractors in Greenfield Iowa home power wos facing electrical problems in your Greenfield home don't risk DIY fixes partner with a trusted residential electrical contractors in Greenfield Iowa like rewired Iowa they're licensed electricians specialize in handling all your home's electrical needs from lighting installations and Outlet repairs to troubleshooting complex issues they'll keep your home safe efficient and powered up for a worry-free living experience"

},

{

"VideoID": "1110",

"Title": "VIDEO: 1 killed, 2 injured in electrical accident at Tennessee home",

"URL": "https://www.youtube.com/watch?v=wKVlXzhl0Ko",

"Keyword": "Residential electrical construction",

"Transcript": "BLESSINGS AND SHE PLANS TO GET NARCAN TRAINING AS SOON AS POSSIBLE. THANK YOU, STEPHANIE. A JULIET TODAY. ONE MAN IS DEAD, 2 OTHERS HOSPITALIZED AFTER A LADDER HIT AN ELECTRICAL LINE NEWS TWO'S KENDALL ASHMAN JOINS US ON QUAD OAK DRIVE WHERE THE ACCIDENT HAPPENED. SHE SPOKE TO NEIGHBORS AND A FAMILY MEMBER OF THE VICTIM KENDALL, WE SPOKE TO THE BROTHER-IN-LAW OF THE VICTIM WHO SAYS HE WORKS FOR A ROOFING COMPANY. HE WAS WORKING FOR A HOME JUST DOWN THE STREET FROM HERE WHEN THE LATTER HIT AN ELECTRICAL WIRE. HIS BROTHER-IN-LAW SAID HE LOST HIS LIFE HERE ON THE SCENE. WELL, 2 OTHERS WERE TRANSPORTED TO THE HOSPITAL WITH UNKNOWN CONDITIONS. NOW, THIS IS VIDEO OF THE AFTERMATH AS AS A MIDDLE TENNESSEE ELECTRIC COMPANY CAREFULLY LIFT TO THE LADDER OFF THE ELECTRICAL WIRE. THE COUPLE DOZEN NEIGHBORS WATCHED FROM ACROSS THE STREET NEIGHBORS. TELL ME WHAT THEY SAW WAS SO HORRIFIC. SPOKE WITH ONE NEIGHBOR WHO SAYS SHE WAS INSIDE HER HOME WHEN SHE HEARD THE COMMOTION WHEN SHE CAME OUTSIDE, SHE CALLED 911. AND SO DETECTIVE MAJOR ROBERT STAFFORD. BUT THE WILSON COUNTY SHERIFF'S OFFICE WHO SAYS TO SHOW IS NOW INVESTIGATING WHAT EXACTLY HAPPENED AS THEY SPEAK WITH NEIGHBORS WITNESSES IN THE ROOFING COMPANY. A MAJOR STAFFORD SAYS NO CRIMINAL CHARGES ARE BEING FILED AT THIS TIME THAT THIS WAS A PURE TRAGIC ACCIDENT REPORTING IN MOUNT JULIET AND"

},

{

"VideoID": "1113",

"Title": "Crisp as it gets 🫱🏻‍🫲🏽 #electrical #tradesman #bluecollar #electrician #residential #sparky #diy",

"URL": "https://www.youtube.com/watch?v=2wIpNeAQf6U",

"Keyword": "Residential electrical construction",

"Transcript": "can't take turn in my we you can learn let's see how you Cann why me go like the wor and I ain't smoking no sh I'm QP"

},

{

"VideoID": "1114",

"Title": "😮‍💨😂 #electrical #tradesman #bluecollar #electrician #residential #sparky #diy #viral #comedy",

"URL": "https://www.youtube.com/watch?v=2uriiyA\_qDE",

"Keyword": "Residential electrical construction",

"Transcript": "clean ass holl bro we got down for lowy yeah we got down bro P Bro need to put a strap right there bro me off PE throbbing right now fool straight up dog"

},

{

"VideoID": "1115",

"Title": "#diy #renovationlife #electrical #construction #carpenter #remodel #homerenovation #fypシ #realestate",

"URL": "https://www.youtube.com/watch?v=0uRFJ6INqh8",

"Keyword": "Residential electrical construction",

"Transcript": "thing you never know about a move out turn is uh what's in the fridge what's behind door door number one Derek it's a horrible mess so gross close that up"

},

{

"VideoID": "1116",

"Title": "Residential Electrical Service Work by B&amp;D Industries and IBEW 611 Keeps Community Running",

"URL": "https://www.youtube.com/watch?v=\_UIRRG5edjc",

"Keyword": "Residential electrical construction",

"Transcript": "for years on this program we've talked about the expertise of the nika ibew powering america team on projects all across the country both big and small but rarely do we focus on what they do in the residential side of the electrical construction industry that's not building homes that's servicing them an outlet moved a home theater wired or a new panel like this one installed by the best electricians and technicians in the world it's happening more and more all across the country trading in job site elevators for doorbells and for one contractor in albuquerque it's a whole new way of doing business service work is something that kind of happened as a result of our customers needing us to do it buildings always need maintaining there's always work to happen so they're kind of like the backbone of our company they're what we say keeps the lights on and having that attitude of whatever it takes motto of whatever the customer needs we can do it is what we do [Music] unlike larger commercial jobs almost every service call is an emergency whether it's a restaurant needing to restore power back to the commercial fridge or a resident needing an air conditioner to power on during a scorching new mexico day all jobs and service work are critical that's why it's vital that the ibew local 611 anika contractor b and deep have a productive and trusting relationship we're very proud of that relationship that we've built with b throughout the years you know with them providing a lot of job opportunities for our members you know providing critical service needs essential power for emergency calls uh 24 hours around the clock i'm equally proud of our members that promote the ibw and promote our signatory employers when they represent them and interact with the end users or our customers out there our electricians they are the face of the company they are b and d we call them the boots on the ground they're the ones turning the wrenches they're the ones you know turning the lights on they're the ones doing the work our job is to support them so the trust that we have in them to take care of our customers is why they do what they do and that's why it's great that we have ibw tradesmen that are true professionals of what they do we know when we get dispatched to any customer that job's going to be done properly safely and timely it's important to work with skilled electricians because we need to be the most efficient we can to get to the next emergency people wanting to get their ac up and running you know people come in a panic when their power is out because a lot of businesses can't function without power and so we're that saving grace to come in and get them back up and running and time is money the powering america team must approach every job with their deep well of knowledge because every situation brings its own set of challenges the learning never stops no matter how many years you have on the job it's never boring it's you know one day you can be in a ditch fixing a conduit that's broken next day you're in this beautiful building fixing a 10 000 chandelier you know and it's a great thing about this trade is you're learning all the time you never top out when you think you've figured everything out you'll run into something new supply and demand there's a demand for work why not be the supplier that's what b and d found as they began to ramp up their service division the thing that traditionally folks think about union contractors is we can man up quickly there's a big job going up we can go from zero to a hundred person crew in a matter of a month or two and that's a wonderful thing and people think of union nica ibw electricians the big job guys right the thing about it is if we put in a call to the hall and they send us a journey man we know that that individual's trained they're prepared they're ready and they can do the types of things that we're gonna have to ask them to do on their own lone ranger style and service that's wonderful while it's not highlighted as often as the big jobs service work is an invaluable part of the neek ibw powering america team it's the work that gets business back up and running the work that brings power back to your house your neighbor's house and our communities for electric tv i'm dominic garatono be sure to follow us on social media for behind the scenes extras and industry information"

},

{

"VideoID": "1117",

"Title": "#321 Moving from Commercial to Residential Electrical with Matt McCarthy of M&amp;J Electric Inc.",

"URL": "https://www.youtube.com/watch?v=CW5z6In0dIo",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] [Applause] slow down you crazy child you're so ambitious for a juvenile but then if you're so smart tell me why are you still so afraid [Music] where's the fire what's the hurry about you better cool it off before you burn it out you got so much to do and only so many hours in the day hey but you know that when the truth is told that you can get what you want or you can just get old you're gonna kick off before you get halfway through when will you realize the construction lives for you Matt thanks so much thank you Manny oh dude it's good to meet you man awesome we chatted a few times had really a long long conversations about this industry and what you do and what's going on and all kinds of stuff so we got uh let's record it let's do it let's put it on tape thanks so much for being uh coming to the studio and being a part of the show thanks for having me man this is awesome nice little setup you got here this is this is awesome oh we like to try to hospitality you know yeah a little bit but I do thank you so much for you know absolutely I was wondering when this was going to possibly get used or whatever but also the speaker that you brought me yes is insane man yeah so I love that so much and you're a hoodie too master a hoodie I'll be sporting that yeah totally be sporting absolutely uh let me tell everybody who's here so Matt McCarthy's here M J Electric uh triple wmjelectric.ca and your email is uhm McCarthy at MJ electric dot CA and also info mjelectric.ca that's right and then on Instagram it's m ant the word and J Electric that's right shout out to uh Dan Dan wall Covenant yes I always got to look at Angelina because she's smarter than me yeah she's the one that runs at all that's all it is so I'm wearing his tea Covenant House thank you so much today is going to be electrical day it's electrical well no one I love uh listen I love having conversation with electricians man yeah because you guys know what you're doing you know what I mean you know most I just want I want to start off we're gonna get to the nitty-gritty go I want to put it to rest right now I see all these Instagrams tick tocks you're gonna talk about vacuums or brooms I'm going to talk about vacuums okay all right I want to tell you you don't think okay if your electrician is not cleaning up after himself you got the wrong one and I will see it right now it's bottom line I've been doing this I look like a young guy um yeah he's 19 years man 19 years uh actually I looked at my license the other night is 20. wow I started when I was 17 dropped out of high school um and went right into it right into the trades yeah and then I unfortunately had to do night school to finish start the apprenticeship and do all that but yeah I got right into it from day one I worked during the day went to night school at night and here we are did you get a lot of flack being so young and coming into construction like who are you kidding yeah I don't it's such a stigma I don't want to say construction was different back then but it was yes it was and it was this old mentality and you hear everyone jokes you know Foreman throwing stuff at you uh that's you know right or wrong it doesn't matter but that's the way it was yeah and there was definitely I would say a lot more respect um when it came to as the young guy what your job was you weren't entitled when I started we had we didn't have battery tools we had a hacksaws cordless yeah with a one-inch auger on it yeah with a handle and I can wind it up right so yeah um so my job you know even though you start at six guess what I'm there at 5 40 opening the Dropbox is running thousands of feet of extension cords because we didn't have uh cordless tools and uh you know what at six a.m when guys showed up um you're working at six you're not just showing up at six and having your coffee and the Slow Roll right into the day to six o'clock that forming better here things moving because if not you're going to hear those he was a big Portuguese guy Nuno you know and uh um you hear him coming man what was on Commercial sites commercial so I I'm I was always I've always done commercial since day one commercial institutional and a little bit of industrial that's where you guys have to um and I'm not dismissing the res yeah I think there's a lot more thought process going on in commercial yeah no I agree I see what you're saying like when you're coming into um you get I mean we can parallel runs for services yeah and yeah you know big bigger stuff yeah um yeah definitely a lot more you know you're doing anything from fire alarm to security to um taxi data data cabling uh lighting uh panel you know any all you're doing all that conduit work conduits all kinds of conduit four-inch conduit yeah oh my gosh how do you bend four inch condiment we have a on like a electric Bender really yeah for four inch yeah if you have enough money you can use whole prefab from the supplier that's too expensive though you can't make money that way no especially on a commercial no but the the vendors out there now they're they're high-tech but they're expensive I think Greenlee has one out there for like 20 grand 25 grand for a four inch I could be wrong someone let me know but I think I think uh it's up there but I mean they're all digital now I've seen one where you can you can uh um set the degrees of bends that you want like a computer and it'll it does it for you and it moves the pipe along and all that yeah it's like a it's like a table rig it's like a table Yeah table bender we call a table bender that must be pretty cool to see it yeah yeah so um so my first company I was at I was there for I've only ever worked for two companies I worked my first company I was there that says a lot first of all Matt that says a lot instead of you just jump in yeah this is a better race somewhere else yeah you see guys now with resumes you know they think it's good that they have 18 different you know it's it's a question you're not there longer than eight months what what's going on right you were rubbing someone wrong or they were a dollar Chaser right something like that so yeah um but I was the first company I was there for 15 years um and learned so much there um big company medium size like um 40 guys 30 guys that's a that's a big company right yeah um Theta dated like cabling division on this that was a part of that maybe electricians they had 20. all new commercial work or mostly new okay um a lot of some Renovations we did a lot of work downtown Toronto Queens Park um got to see a lot of cool stuff with that company um didn't leave on bad terms just I moved out west like not at West I moved into Cambridge area yeah out of the GTA out of GTA they did a lot of East End work um it just it it became a lot for the trans especially starting at 6am working in you know Scarborough from Cambridge that's the unfortunate thing if you're a tradesperson in Toronto you expect to drive at least a minimum an hour and people think an hour if I'm an hour that's you're lucky yeah that's no problem I'll do that man so and I was like you know company truck and it wasn't it wasn't had nothing to do with that it's just it was my time and um you know we we had discussions about it they tried to accommodate me it just didn't work out so um I moved on to another company I was there for five years and that's when I I decided to uh to open up this one after that how is how was your experience becoming an apprentice and working with journey and then getting that whole thing outside of the razzing and all that yeah no that was okay you know what the company I was in where I started that was amazing because it was a lot of family okay a lot of family uncle's cousins um everyone had um like an interest in the company to do and not just to make money but to make sure the work to make sure the work looked a certain way yeah not just slap it together um and I think by learning that off day one I didn't get into any bad habits a lot of guys out there have bad habits and it's not their fault you know if you get set up with a journeyman who who doesn't have I don't know what you want to say that the care not care but we just there's more interest outside of the scope of work that he's doing instead of the scope of work is it the apprentice's fault that when you get him he doesn't know any better right yeah but you hear a lot of sparkies talk about uh they're not teachable like they don't want to learn I agree with that to a certain point but I mean that's I'm not going to just say electricians no no anyone anyone in the trades yeah yeah um you know what you you give me give me uh so my second company I was at was a larger um company and I end up being a foreman for them with some pretty uh pretty big jobs and I would tell my project manager give me like half an hour with a kid and I'll tell you right away what were you looking for just a sense of Drive okay you know um I would tell them you know they would come into the trailer we'll go through all the paperwork safely talks and I would sit you know I wouldn't um I let the other guys go sit down one on one with them you know I'm not here to yell and scream at you it's not that's not my style we know though what the work needs to get done at the beginning of the day there's a to-do list on our whiteboard and everyone gets their job and you know in our eight hours that's what needs to get done yeah to stay on schedule and on track uh I have bigger people to answer to that are a lot more scarier than me and no they're not scary just true you know you're dealing with the owner directly who has a real personal interest in what's going on well he's got a question millions of dollars right you're talking like Electrical uh job that's 13 million electrical contract that's not chump change that makes or breaks I know right that decides whether or not you gotta work for another year yeah so um you know you give me that I'll say you know don't ever ever let me catch you just standing there if you look hard enough there's something to do if you see a piece of wire on the floor if you not go clean it up something you know I might see you and say hey what are you doing no okay come with me let's go but don't or walk around with a screw you know or or start if you see a guy bending pipe go over there hey you know so stuff like that um so you you learn pretty quick on on kind of their sense of uh interest in kind of where their heads at for a part of team too being part of a team how well they gel yeah it's not one electrician is putting the stuff together man you're all working together you may have a guy doing all the conduit yep another crew following you doing all the wire you know hey would you do it's okay yeah no problem okay pull the wire here right so everyone's got a gel together and and not only mesh with each other on a team as electricians but also with the drywallers with framers with you know it's not just done so you have framing so talk to the framers hey you know we're hoping to get this floor done when you guys think Friday okay perfect Monday yeah give them a heads up it all comes down just to communication on site I think a lot of guys see that right yeah it's all communication well you see mostly young guys getting into the business or were there some guys that were changing careers and getting into the business a little bit later on I've seen a lot of um old like you know late late 20s early or 30s um I can leave a couple guys coming from like the banking industry uh really yeah I know I don't think they were out for them no they weren't like uh big hedge fund guys but no no no but like that I guess yeah I think it just uh they just figured you know the political office life isn't for me and I I think you I think you hear about you know construction's not for everyone either though yeah it's uh it's pretty tough yeah it is a tough racket there and then also to get a kit and also when they're too young sometimes they're not ready to make that decision that's right they're pushed into it yes uh their parents now especially nowadays meaning you know um your kids 15 go go go uh go be electrician and make 100 000 a year yeah find something well that's not why you should be yeah you know I could be making 30 000 here I still love what I'm doing you know I can wake up at 4am and be happy because I love what I'm doing so what was it for you though Matt when you were in high school and and like you're young at that time yeah why electrician why bless you why bless you um so uh I think it was grade 10. what did you see or who did you I didn't see anything okay I was in grade 10. and I came home with my report card I was very famous for always the teachers never giving report cards or they forgot my name so I came home I think I got oh boy that's embarrassing like a three percent in history three percent yeah did you even show up uh so this is what my dad was most mad about okay the fact that it was three percent not zero like the fact that you gave three percent you might as well you might be like why did the other way or they just don't show up yeah like what do you right so anyway what did you accomplish for three percent I I couldn't even tell you okay okay all right um so obviously I wasn't I was a goofball I was a Class Clown goofball didn't care um had other things to do better things to do I do everything so got a good gig at Rona so I said I'm not gonna go back to school so got a good gig at Rona in the summer as a forklift driver at a one of their spots in receiving man I think I was making like 24 bucks an hour as a 17 year old kid and I was like not bad this is not bad and this is quick math I don't know 18 years ago yeah two decades ago that's good money so like like I got to work 6 a.m to 2 A.M weekends off so I broke it to my you know I'm not really thinking about six to two p.m 6 a.m to 2 p.m okay so beautiful yeah no it's like Prime hours man prime rate home have a power napping well with my friends when they get home from school um so busted that news and uh I think it went the way of me coming home one day my my father my father's electrician okay uh started out not anymore but did the all that and worked for Square D and schneiner um and came home and he goes uh there's nothing wrong with working on Rona but you're not my son's not making a career at Rola and I had a pamphlet on the on the uh table for electrical pre-apprenticeship okay you want to go there starting I think was like the Monday or the following Monday and that like that's your choice so that's how it started yeah and that's how it started that was the first day my loved it yeah yeah uh my first term report card so I did a year my first term report card I had like all 98s not 97 37 yeah and my so yeah I like it this is this is what I want that's what it is man everyone's got to find their deal it just clicked yeah and since that day yeah hit the ground running so the apprenticeship was good Fellowship was good um I had good guys Smart Guys good electricians still keep in touch from that Old company with a lot of the guys um even like the operations manager has me on Facebook and messaging me once in a while yeah and I never um burned a bridge you know you know is it true that it's hard like I mean you you everyone still stays connected because it's hard to keep Good Guys yes so you just never know you don't know where I mean you right now you're on your own but you're with the company for a while but you never know what's going to bring for you that's five years ten years from now and that's the thing uh everyone looked at me um so I worked my second company is that that I just left it was a larger union company uh first company was not Union okay so I ended up going Union just because it was more of a West End boundary you're always going to be in this built-in uh to Cambridge and they were strict with that kind of thing right okay uh you're gonna be a foreman truck phone right off the bat um people are going hold on man you're you're making how much money as a foreman your pension your vacation pay vacation what are you doing to open up your own company hold on a second your girlfriend is pregnant [Laughter] and hold on we're in a this thing of a pandemic yeah and you're stuck you're opening a company there's everyone's closing what are you doing why are they so surprised I said if I'm gonna do I'm doing it now that's the best time to I was 35 years old if I you know I felt like if I didn't do it then it's just gonna forever be a what if right you're quoting jobs you're meeting clients you're doing everything that an owner does why are you not doing this and it just clicked did you like the union versus the non-union I'm not no no I'm not trying to listen man I have respect for the unions right and it's I think it's it goes back to the trade I got I got treated the same way okay great put it that way perfect in the same um also I'm not here to to blow my own horn but I never needed the protection of a union in my work you know um I I never keep her job yeah I always have these guys at the end of a job where are we going next what's the next I never want you know what in in my entire career of 20 years I've never been laid off for one day once you start I actually begged my the last company we were in between jobs um my girlfriend had her daughter and I was doing crazy hours the job finished up the next one it was like a four week kind of period And I remember begging the project manager saying like please I'll just give me the four weeks off and he goes Matt you don't let good guys stay home because someone else will scoop you up yeah so he for I we worked out an agreement I only want to do half days or I was picking choosing what sites I want to go to because what guys are there and what at least they understood they understood you know when and listen I don't do I'm not a special electrician I just go to work keep my head down do what I had to do enjoy what I'm doing and give a great end product and I I um I cared about the end product of how it looked and it represented my work I could go like the pictures oh I love this it's great great right going showing all your family at home look what I did they get it no no your dad must have got it my dad will get it he thinks it's pretty cool he always you know a lot of my friends are in trade so is your dad's showing him he's showing you his Polaroids no he started in Montreal right so I think it was a whole different game really yeah I mean I don't even know um I'm trying to think they don't even have an uh what is called but I don't know what it would be different there are other I guess the names and all this other stuff right so yeah so he would you know uh in my home a lot of my friends um are all trades so they don't care what other ideas electrician or did they get into it no I well I have a lot of electricians um HVAC Plumbing gas fitters so all kinds of tickets all the tickets all the tickets yeah Big Stuff Red Seal which is like Recession Proof stable work yeah it's you know what if you're good you'll get yeah I'm not worried I don't you know um obviously I want m j to be here till my son if he wants to take over or if not that's fine too but worst case scenario I'm not I'm not worried you know what's the m j what's the uh Madden James so I do have a partner okay he wasn't able to make it today okay maybe we'll do another one what's his name James James all right cool we call him Jamie to annoy him his actual name is Jamie um no but he so he's uh so he was pretty much like a lead hand uh when I was a foreman at the union company he was like a lead hand for me okay so he's kind of my go-to guy um he's 20 oh 26 or 27. okay a little bit younger a lot younger yeah but man does he has strife he has drive and we're just sitting in the trailer one day and I think I joked about it or I don't know even it came up like that let's do it next thing I know obviously we're applying for business license and I I got my masters I got my masters James James is licensed really so yeah so I'll be honest Matt it's like not a lot of like like trades partner up like that right no a lot of people are saying oh you're doing it with someone else yeah yeah it's a lot of them are going solo yeah but I think you're better off if you partner I I like it I knew him good well enough I knew his work style is the same as mine that's important yeah um you know what me and him we fight and we'll spit what's off our mind and we maybe won't talk to each other for a couple hours but at the end of the day job's done yeah Trump's time we we you know we'll send a text that night you still love me right and then uh we'll move on to the next one that's it um because there's gonna be another fight yeah but there's gonna be another job and everyone has a position in the company you know not ever just because you're an owner not everyone not one person makes all the decisions it's a mutual thing and you know what you're you're good at the on-site guy running things that's your thing my thing is meeting the clients and getting the contracts and getting the work so everyone has as long as everyone understands what their role is in that company um I I think I think it works fine for us it's been working no problem we're still early but I think it's been yeah two years and especially two pandemic years yeah and we this year we had our greatest year the number like mind-blowing really good yeah it's all Word of Mouth um we hooked up with a lot of interior designers um uh GCS so you're doing resi now so I got into uh cut more Custom Custom Homes yeah we'll still do I still take on um people calling me off of Google or whatever and uh you know uh basements kitchens you know that's easy peasy was it difficult for you to ship from commercial to Central commercial electricians have no business in resi really what is a different game man what are they well just the way you run things and how you do everything and you know and there's no t-bar ceiling it's all in drywall um it's and and you know rezzy guys I see come to commercial they have a hard time with the pipe and so it's really it took his um I'm sure we probably lost money on the first couple jobs just the way we were running things was the same thing James yeah same thing both of you guys are looking at custom resin yeah wow um so you know the way we run things isn't how a res electrician would do it there's tricks no you come off the switch here or add that plugged you know all these little little things why don't you pull a three wire to this box and come off with your two circuits instead of two separate runs so uh I have one of my best friends uh I've known him since we were seven he has Electrical Company so we mean how do you do this oh yeah no you don't do it like that you guys yeah when he does commercial he comes to me right because he's always a resident guy pick your brain you pick his brain yeah yeah that uh so definitely on the first two jobs I think the esa inspector made a joke when he came on to our first house what did he say he goes uh you guys uh you guys are commercial electricians what was he noticing it's way too neat you spent way too much time stapling and making things look good and uh not to say residual no just it's just a different you know measuring out Staples probably I don't know crazy stuff like that it was you that sent me yeah you sent me the picture of the rafters no no I thought it was using some someone drilled through all the rafters to run their 14-2 really and I was like no we so we don't go that far no but I'm like why are you doing that man you don't that's great great ambition yeah it's really costing a lot of money I I think it was I'm trying to remember who sent it but I was like I was questioning if you're drilling a one-inch hole in a two by four how good is that for the roof yeah yeah I don't know if it's compromising so Esa I think in 2021 the new code that just came out there's a new rule that when you're running wires in the attic space you have to be if you're how do I explain it without them seeing my hands you have your your ceiling joists and then your Rafters yes if it's more than one meter in height between the two yes before between your collar yes and your rafter yeah if it's more than a one meter height the wire you you can't run wires past that point anymore so when you you can't do a full send from one corner of the house to the other but you can let it just ride the bottom of it although it has to be within that meter oh within that meter yeah really so that no one because they don't want people walking in the Attic anymore stepping on the Romex so either you have to drill through every ceiling joist that's why they did it or you have to stay within a meter yes or less so that is uncomfortable for someone to walk in there yeah I get it yeah that's new I think that came with 2021 this is just mirror Zsa always uh and Simon's listening right now but are they always just making up new [ \_\_ ] rules man uh it's a license to print money the manufacturers already know how to bring out new stuff are they really absolutely so there's a lot of little electrical lobbying going on envelope here envelope there I'm doing quotes right now no we got video people can see you um but I seriously so that's what's going on right now man how do they put some of this stuff I don't get some of the stuff that they put in there um silly stuff now here if you're in a flood area your whole basement has to be GFI protected so now it's up to the electrician to find out so I'm in KW area you have the uh Grand River yeah so there's you have to your whole basement you have to get a hold of the conservation um I know the tree police the guys who will find out what the flood zone is for that area and if you're in a flood zone everything in the basement has to be GFI protected everything I don't I don't agree with that right so I got into it with uh I didn't get into it with this factor a bit of discussion yeah saying it didn't happen to me but we got in we talked about it and I said how am I supposed to know if this is a flood zone so they just make up stuff makeup I I'm not even a fan of arc fault uh receptacles pain in the butt I don't every time they plug an old vacuum in and it trips it trips it and then I gotta drive two hours on a Saturday to go reset it and it's gonna happen again now is that a money thing because now you're damaging that so now you got to get a new one and you gotta change it I think if you want to actually talk like CSA standards and someone tell me if I'm wrong if what breaker trips one time I believe technically and this is any breaker okay I believe the rule is you now have to replace it because it's had a fault some I don't I didn't realize I think someone told me that in a training so I guess technically or mechanically speaking that breaks down doesn't have that same integrity so it may not trip again if there's a search yeah that's their Theory yeah I guess then that means you'd be spending so much money hiring an electrician to come in here to change a break I think she I think the trainer did say that because I remember someone challenging or saying well why do they make Breakers reset then because we got tired of unscrewing she just kind of really moving on next slide yeah you know you know like how expensive that would be if that was The Artful Breakers now oh it's insane how much they are right our fault breakers now you got that combo arc fault gfis you can do um basically your whole house is Artful now except for kitchen in a bathroom right so then your vacuum's dedicated but then if you plug in a Dyson Dyson's consuming 15 amps isn't it so you can't use a Dyson I guess on the bedroom floor and it's not even it's not even the amperage it's it's the because you're the motors and the vacuums have brushes right and then on a motor the motor turns and then you get an arc between the brush yeah I don't remember trade school I don't know commutator okay something like that anyways you get an actual art that's it that's what happens in Motors there's always arcing yeah well the breaker picks up that fault thinks it's a fault Arc fall and trips um I think it happens with like a lot of older I thought it was designed like they're definitely gotten a lot better kids were like overloading all their receptacles in the bedrooms and then fire started happening yeah so though came the Christmas the whole principle I think the states came up with the whole Arc Vault first of course um and uh and what they figured was um in your bedroom how many beds get signed up against the wall and you know I think probably even my host I haven't done like it the the bed's gonna block it so you plug it in and then you slam the bed behind it and you're you're crimping the wire and the pluck the plugs coming halfway out of the wall you're creating and then you get dust right yeah a lot of dust because you don't clean behind your bed you don't pull it out and clean so you get dust and then when that dust if there's a spark that dust is what triggers the fire um there was a statistic in the states when they introduced uh arc fault um it was a high percentage of fires that that it uh fires came down significantly in the houses is it true though I'm just curious about uh smoke alarms now you have to have the three right regarding OBC so you've got to have smoke carbon and strobe yeah so carbon only needs to be like in your main area like top of the stairs the main floor at the bottom of the stairs I thought carbon had to be in every single closed bedroom they changed that rule as well too because the carbon monoxide while you're sleeping you can't detect it yeah so that's why you have to put on every single floor and then one in every bedroom yeah right and that's why on On Any Given if you've got a four bedroom house you can have five carbon detectors on that one floor right and they were supposed to be I think hardwired with a battery back all hardwired interlinked right yeah so if one goes off they all go off yeah um last I know I mean if it's new I haven't heard about it but we used to you'd put a CO um like in the hallway yeah yeah the um bedrooms yes and then the smoke strobes in the bedrooms yeah that's right and then uh yeah yeah that's I don't mind it's I mean it is what it is I don't know if you I I have a newer house um and um my girlfriend was pregnant at the time I was working really early in the morning she called me at like 5 A.M um she's crying and she says the smoke detectors are going off are they okay what do you want me to do yeah you know I'm kidding an hour away and just so um she said well main floor is nine foot ceilings oh okay and then upstairs so I mean granted she was woken up from deep sleep and she's praying and things are all over the place and and she goes uh I say well is there smoking like did you look outside the bedroom yet no okay go go and look is there a natural fire going right so she looks like she's in tears and she looks no I say is there smoke do you smell anything no as well listen uh call the fire department I don't know their number man I gotta go was it a fire no so I guess dust was it was when we first moved in maybe about a year later yeah who knows right um but the strobes Manny the strobes are deadly I don't like them so it went off one another night when I was home at 2 A.M I couldn't see I know she was laughing I was holding the wall to get to the light switch to at least turn the lights on your house turns into like a 1980s music video yeah and it's bad it's coming out of a deep sleep like that you were so discombobulated you're out of focus on your vision yeah and then you're getting this strobe into your vision I think it's and it's blinding 80 decibels the the sound 85 decibels it's bad man that's why I don't I don't I mean where is this testing coming from where are they coming up with this stuff I don't know let me share a little history here man history and construction history of the light switch this is gonna be good the electric light switch was invented by Thomas Edison in 1880 it was one of the number of electric components for the light displays he built that year in 1884 John Henry Holmes invented the quick brake switch it was more durable and worked Faster by reducing the time it takes for two electrical contacts to meet within a circuit uh his design was very popular in the late 19th century 1917 Maurice Goldberg and William J Newton invented the toggle switch these switches are still common in North America switches have changed very little since then but computer technology has allowed us to activate switches remotely using sensed environments via signals Etc in the future we only see what more or see what more is going to happen now we're all app enabled and Wi-Fi what is it uh what they call again uh um the switches that are relay into a nap what are they called uh cassette yeah cassette yeah I don't know why I forgot that name but yeah so now you can you could park a like a face of a switch somewhere yep you don't even yeah Pico Pico switch that's what it is Lutron has the big one out there I think Pico I know but like so they're not you don't need a box you don't need anything you just need a signal being released a signal are we getting like that to the point where we're walking into our house and there's just like if we had infrared glasses on we would see all these signals all over just wait from 10 years is that what it's going to be like sure isn't that doing anything to us I'll be doing something it's got to be doing everything nowadays does something to you there's just drink too much milk is bad for you not enough it's not my doctor said not enough sugar okay stop drinking having sugar and okay no you need a little bit of sugar no sugars oh my gosh I'm gonna go to the mechanic and ask yeah yeah oh that's what I mean so like you're always adding more and more new stuff to the home yeah I love it I guess everybody now is asking it's not cold yet uh battery charges for electric cars no it's not cool um I think is it a building code wait sorry uh correct new construction yes you have to run it yes but not necessarily contaminate it yeah correct a pipe whether you're doing a conduit or the wire there but you don't need to terminate into the panel so why don't we okay every person that I know that has wanted or has a electric vehicle they also have a pool they have a hot tub they have all these other components that saunas and saunas yeah big one so are we running like I mean 200 we were talking off Mike before we got started right like all Toronto is all most of it is 200 amp ran and then Toronto or no no like a lot of so I don't know too much about Toronto is I know the older stuff is all 100 amp or 60 amp yes um the newer construction now and I don't know what year it would have started when Hydro did it but even though you have a 100 amp service or let's say not service panel in your house Hydro will already give you 200 amps to the meter so all you have to do is just change your panel and it's you're ready to go and the wires from the meter to the panel that's it and that's it and then you've upgraded your panel they don't have to do anything because nowadays any typical house does not it's not sufficient to have a 100 amp panel no no I mean if you want to do it you might as well go 200 and call the day by the time you do now Esa is cracking on load calculations really before you could um you know install a hot tub and get it passed and that's it but now Esa knows you know you're doing a hot tub maybe you're doing a car charger what's next right so they're making you do these load calculations to see even though it's 100 amp panel and you don't have much Breakers what's the actual load what's the calculation again they're they're square footage of the house and then they're asking about how much consumption it's how much 80 of it or 80 so you're allowed 80 amps okay but that's the theory that you'll have your sauna on your hot tub on your electric car is charging all that together but that's not how your house operates man well so then why is the the governing body asking you I know gonna get a lot of letters man yeah that's all it is yeah but I mean it's just okay so what are the worst case scenario that I guess it is um worst case now I mean realistically you're you're tripping the main breaker that's the worst case here exactly but then again we go back to your point earlier where it's like that breaker's fault now so we have to replace it right no one ever's done it no I'm only going to win the history of electrical has ever done it I still immediately I'm still curious about that I wanna I wanna look into that on myself anybody else is like listening they want to shout out to anyone at a CSA or something listen man I still have a commander panel that I can't stand I know I know and you can't replace those oh no like though that's that's that should be in a museum or whatever but I think keeps on tripping just because I'm changing things and [ \_\_ ] and it's just I just I trip it I put it back yeah but I'm like I gotta pull the trigger one day and bring in a Sparky yeah get a proper panel in there yep because that Commander panel sucks yeah the breakers suck but I mean like what panels do you like working with I love a nice home line yeah Schneider home line um Snyder's been around a lot like Roger's been around they used to be squirty Merlin girl in federal Pioneer squarely my missing one stab lock okay Federal Pioneer with stat block uh yeah they've been around for a while I mean I don't really care um my supplier that I like to prefer to use is uh Square D okay rap so that's why I go home line how's everything in your I know that in Toronto I've done the standby generators I've done a panel swap I've done uh added a second I split the meter so you can have a dwell in a basement apartment Toronto can be a pain Hydro I don't know how it is outside of Toronto we did custom home um at Royal York and Islington oh yeah you had fun yeah that was a fight really yeah really looked incompetent on that job though um told the homeowner I mean I showed him emails fighting with Hydro to get this service hooked up overhead service um it's funny you bring that up because I every time I deal with that just a fight there's a train of emails that you have to present to the client just to show them you're doing your job and then he's coming at me and I'm showing him and while there's a GC for that project so he's going in between the GC homar GC me I said you know what let's just get the I'm going to show you like we're not I'm not I don't want to do I don't want to you're not picking a fight four months like oh so why show them yeah no that's not acceptable I hate to tell you but hydro's Monopoly if you don't want to do it that's why they you're not getting what they do who are you going to you can't call anybody what are you doing and it annoys the hell out of me um the homeowner made one phone call and they were there the next day don't ask me how why um he got off the phone he called me goes I just talked to hydro it was easy they're coming tomorrow what did they pay I I I don't know how you did that but no they paid something it had 12. Hydro has those stupid rates yeah if you want it done tomorrow it's x amount if you want it done next year it's x amount I'm exaggerating next year about six months or whatever yeah I just got we're doing custom home and water down um we got a quote from them to to a new to change the service from overhead to underground and it's a far run probably 400 feet um took them like two months to give a quote and then they said by the time we have to receive the payment in full to book the job yeah so fine um and then they say yeah we're booking uh 17 weeks out and by the way if by the time we do the job there's Frost in the ground it's an additional sixteen hundred dollars I think Seventeen weeks I said of course there's gonna be frost it's gonna be February if you're booking three jobs during the course of the year one of those jobs is going to hit Frost so 17 weeks in Frost yeah so I just picture a little disclaimer I don't know anybody that works at Toronto Hydro but I just picture the adminster staff just like walking in casually yeah big jelly donut sandwich cigar yeah just like taking their time just to log into the computer to find out who's in the queue and what's going on and what do I have to do yeah what do we have to do today ah what's in the kitchen dropping a little jelly in there I love when they say the queue that's probably my most favorite line uh I've heard that at least you're in the queue I'm in the queue you weren't in the queue if you're not if you're not in the queue that's a big problem you want to be in the queue it sounds like a Seinfeld episode The queue but I don't you're right it's a monopoly and they've got to stop that on that same job we're demoing the house okay complete to the foundation uh so obviously you have to get the overhead service removed from the house before they can do that so called make the arrangements and they said it's going to take us four to six weeks to have someone to come out just to assess but so my I took it as to come out and do it so I said no problem because I knew like we we mean the GC we've we started this process all like we're that's fine six weeks beautiful the guy comes out um he goes okay yep I said are you going disconnect he goes oh no I'll just let them know everything's ready to roll and we'll send another truck out he had the bucket truck with him but they didn't have the paperwork attached to them right so then he goes yeah man you're not in the queue why is it and I mean I honestly I would love to get a Toronto Hydro guy on the show that would be awesome I would be I don't know if they'd be able to but I mean I always find it that when they do show up it's it's generally like a two or three percent crew minimum and two guys of the three move slower slots under moral support and the third guy is the Boogie guy yeah that guy just hustles gets it done grabs the gear does it and while the other two guys are literally still fighting with the left sleeve of their jacket you know what I mean he's the one that's the uh the lower Pig read too probably exactly he's trying to make sure he's doing all the work and then we start discussing start discussing things going okay so what can get done here and all of a sudden before you finish the conversation the job's done yeah it's like that's all you need to do yeah why didn't we just get this done man we were doing one one [ \_\_ ] down in Oakville for a commercial property uh for a four thousand uh four or six thousand amp service and they said they were delayed and the uh because the factory is downtime yeah every every minute counts so when I passed on the information to the the building guy BS they're right there on Trafalgar there's six trucks at Tim Hortons so I think he even drove over there I said this is not a good idea because you know this is where social media they'll say they'll say now oh you know emergency call can can come right they'll play with you I think so why can't we change it so it's not a monopoly anymore I don't know because somebody's made it back yeah yeah political deals man yeah all right but keep up the good work guys yeah that's all because we need you we can't move forward without it yeah yeah I love the quotes they give for some residential areas where it's underground to service and it needs to be upgraded the wires because it's not rated for 100 amp and like the quotes that are coming in are just astronomical we did a job like close sometimes like 20 grand yeah so they had the underground service which was in a pit yep across the street yeah that was servicing the house that we were working on so they had to cross three neighbors yeah so they started having conversations with me through email about excavation and all this other stuff and I was like what are you talking about man yeah and then we even had it all marked so they already came even before that to assess and they marked where their cables were but for some weird reason it terminated in the yard it didn't make it all the way to the meter so they couldn't figure out the rest of it so then it became this whole discussion about we have to excavate but we have to do with a uh wet wet vac right right because they have to be careful yep but then they wouldn't do it it just became this whole Fiasco it's like there's got to be another way to do this I did one with Waterloo ah it was probably the funniest one what happened um so you submit for the service layout and that's when they tell you yes you can go do tanjun uh no or yes but you have to this is what needs to be done um so the guy says no the underground wires are not suitable for 200 we got to upgrade um you're responsible for bringing from the prop right to the property line right so your job is on the property you stop at the property line but we're not too sure where the connection is underground I've heard this one before and so I had to call him because I like I thought like what is like hold on a second Hydro like this is like do not have as builts drawings like yeah so he goes yeah so pretty much you need to get a sucker truck back truck and I'll send you a picture of where we think it is man he took a picture of like three boulevards So I says it's going to be like three grand just to find your Wire yeah never mind you guys lost it by the way yeah I didn't lose it it's not it's up to you to find it for us what it's up to me at the customer's expense because they they were able to trace it all the way up until that point yep but then after that point they weren't able to trace it can't find it so it's not their responsible anymore don't care again don't you don't want 200 amps you don't get 200 amps but everybody needs 200 MC says well now you're in a position where you you have the the electric car being delivered or your hot tub being delivered you need 200 amps there's no choice and they're giving you bills like this what are you going to do have you worked on a house yet that wanted 400 no I can't wait though that's Toronto yeah that's a whole set of stuff okay that's you're changing the actual line all the way around right to the Transformer you're changing it yeah that's when you get a house that just has way too much power consumption man that's a lot of 400 amps that's even 200 amps 200 amps is a lot of power for uh you start getting into some of these homes I mean yeah yeah well you need and 400 amp is you tell me it's commercial at that point is that starting point of commercial yeah we do a lot of I think at the smallest one I ever did was 600. 600 smallest you know all the way up to 8 000 amp wow that's just humming humming yeah I can't say for who I think there's like a non-disclosure but no no no no big big big uh big Factory I'm always fascinated about sparkies that have this love for electrical and I'm always curious on why you have the crappy electricians what is it in their life or what happened that they just said I'm gonna punch the clock and I don't care how this wire looks I don't care how this panel looks like I like when social media started and everybody was showing off panel work and everybody was showing off how beautiful everyone's trying to one-up everybody drilling holes behind the panel and bringing the wires from the back and yeah which is all sweet and nice and it always it became an event you know I mean you put the insulation there you have the panel you work with the Sparky as a GC you get everything already fire rated board and it just looks nice right and you want to park that panel exactly where it's supposed to be perfect right but then you do have that small percentage of Jokers why are they like that what happened in their lives man I don't know I mean I would love to know if there's one out there that I know they are like a crappy crimpered or Crap life I don't know maybe they got shocked one too many times yeah I don't know what it is they have no Pride though that's what it is it's got to be that yeah no if you don't have pride I mean might as well get out correct me if I'm wrong isn't it take longer to do a [ \_\_ ] job when it comes to electrical and wiring absolutely than it does to do a good job absolutely so it's actually faster to do a good job yeah yeah there's speed or quality you can't have both oh I know right just do that so okay I have an apprentice who who can tear through a house right slap plugs on uh run pole but it's gonna be I mean as it doesn't really matter when the drywall goes on but wires aren't straight in the stud you know I like snipe straight all the holes the same height and I'm used to Sparky's drilling holes on laser man yeah they'll set up a laser drill holes on laser love it and it looks nice client because it's not easier to fish your wire when you drill a holes on laser instead of having one perception too though when a homework comes in does that not look professional it does right it looks clean this is why we charge what we charge right you get a bunch of dogs I know but the other guys he charges the same amount for doing this [ \_\_ ] work oh true true but homeowners don't really care because I'm getting covered up yeah you know and the problem is too is plumbers and electricians you know everything gets hidden right so people I find really nitpick at those numbers when they get them because why am I going to pay 30 grand for an electrician it's just wires you're pulling you know um okay don't hire an electrician and see if your house works right but um they'll spend you know thirty thousand dollars for an island or I don't know you know I know they're lighting packages are stove 30 40 Grand TV accessories speakers everything that is that terminated at the end of all the wires but it's stuff they can see right TV still doesn't work unless there's power to it right yeah speakers don't work stove don't work nothing works man no so you need the power hey you need to get in the queue plus you when you run things properly it's actually easier and better faster yeah to chase if you ever have to chase yeah to discover because sometimes you in new construction you'll miss something oh yeah right but then you'll problem solve a lot faster if it was run a certain way I already know this goes to the air this goes to here this makes sense exactly not oh my god oh no this one went here I don't know what the top why did I tap this one you know if you do everything in the systematic manner it makes it so much easier not only for troubleshooting but if the client wants to add something change easy yeah I know oh no now we need to make that whole circuit Arc fall or you know what I mean that's a lighting circuit Arc for now I gotta change so I haven't seen any new pot lights or who's got who's got the coolest pot lights these days I did the RGB once in my son's room okay um he's four years old he's obsessed with the color purple purple so when he saw me doing getting my daughter's room ready last year he came over he goes well I want my room like why do you do my room of course my daughter got all wainscotting and feature wall with wallpaper what do you do get cardboard boxes or what yeah my son no he just got like a baby blue room and that was it right yeah um so he goes I want you to paint my room purple I said okay well I mean my son now no problem but this is a big commit purple's a big committed color here light dark purple I think he's a big dark dark purple yeah okay so it looks nightish yeah yeah so I'm not a painter though I hate painting God bless all you painters and it really is can't cut can't cut no no I have to do that's the problem I have to do four hours of taping before I even get started oh just learn how to cut find the right brush and just find that improve score it with a knife I've tried all even those cheaters where the no don't do that I tried that don't do that those things are brutal don't do it it's a mess I despise painting so who painted it then I painted it but you you despised it I I hated every minute of it and you taped the whole thing taped it how many rolls of tape did you use I don't know I think I could have used a few more by the looks of it did it turn out good yeah it turned out beautiful it was like a seafoam green yeah so but uh so I did myself I said no I'm not changing your color buggy purple pot lights so it's the one now with your app where you can go on and change it all different colors nice each poly is a different uh you can change different colors or do whatever you want right so I did that those are pretty cool so he likes that loves it he's got this one red that one blue that one purple and daddy changed them tonight make this one now he gets bossy that why are they yellow I want that yeah so give him the phone I'm thinking of doing them outside next year and doing uh instead of Christmas lights I make them red and green you can do that or you're like your soffit lighting kind of yeah really it's just all in the bulb like everything's in the Box oh it looks like uh it looks like a slim poly really yep but it has Wi-Fi who's making these I used Q Plus they're expensive I think so like what like 100 bucks really yeah but so you get a lot of freedom but what's it worth to you if you to do your soffit lights what's it worth to you not doing Christmas lights every year it's true and waiting too late in the air and you're freezing and right going up on the roofing up on the roof and there's snow and make sure the camera's rolling so you can get a nice Tick Tock video yeah you're falling in all that [ \_\_ ] right so what's it worth to you it's true right uh let me do let me do a little OBC talk here Energy Efficiency for homes at least one programmable thermostat I think that's cold now no you can't do uh regular on and off kind of thing anymore speed program control yeah it's got to be all programmable programmable thermostat control device must allow for the setting of different air temperatures for at least four periods per day and two days per two day types per week include a manual override allow the air temperature to be set 13 degrees or lower in heating mode and 29 degrees Celsius or higher in cooling mode if air conditioning is provided uh manual thermostat control device is permitted if controls a heating or cooling system where the capacity is two kilowatts or less so you can I guess uh serves an individual room furnaces must be equipped with a brushless direct to current motor which all the new ones do in order to supply energy for cooking appliances and clothes dryers every kitchen and laundry space must have an electrical outlet a natural gas line or a propane line uh-huh what that's just I've got gas for dryer and I've got gas for cooking not propane propane would be different uh cities yeah depends right further out but even if you uh if you change your cooktop I remember talking to any say I think agent if you change your cooktop to gas you cannot disconnect the original because wherever my purchase go in there and they may not want gas and then you still have to have even in the new homes going in you still have to put it you still have to you don't have to hook it like just like the car charger you don't have to hook it up but it's still it's got to be there yeah because that's a 40 amp yeah yeah 30am 30 yeah there's a test here yeah no that's it's 40 AM for cook and then 30 am for dryer and those are your two big ones I know that coming from the film business we used to plug in though yeah cam locks yeah which is you're not allowed to anymore I don't think so um I haven't thought of that stuff um I used to do a lot of this stuff with mail coming at city of Brampton like caribran and stuff yeah so we'd be doing cam locks everywhere it's the only way you can get power the big generators on the trailers like 750 kilowatts on right yeah it's insane man yeah cool stuff um you got so you and James do you guys have an apprenticesh apprenticeships yourselves or yeah Prince uh no no you guys gonna bring anybody on yeah so um we tried one we did a really really big commercial job downtown Toronto this past summer uh so you're still in the west end but you're still taking on work in the core yeah I don't mind it because it's for myself now got it a little bit of a drive no we start at six we work till two you missed some of the trucks so yeah we I mean and I'm when I say I start at six I'm probably gonna say that quarter after five yeah I like to get there have my coffee open my laptop get everything going cities I was used to on the sites with the when I was a foreman you know having like 20 guys on site you better know what every single one of those guys are doing before they show up because it's all time is money yeah along you know to have a guy stand around it's no good right and you have to have backup plans so I'm more um equipped with that kind of skill where I got everything planned out I could tell you in three weeks what they're doing right uh if that if that's your commercial training right that's my commercial training yeah yeah that's definitely so um you know you have a guy who's making 15 60 bucks an hour and he's standing around no not as a business owner you're looking at that as lost production huge loss every time he's walking for one screw because you didn't give him the right materials or but that's that's the Jokers and Commercial they like just kind of walking looking busy one percenters moving around that one percenters yeah that's that's the guys they're really good at looking busy but they don't achieve anything no take advantage but they got things that protect them yeah that's the thing they get rid of someone but nobody's also paying attention to are you doing anything you get anything done no what'd you do today nothing yeah but I never told you that according to me I did everything and I think sometimes too when I was a foreman you have the days where you just don't care like I don't care what like just leave me alone I don't care what you like I'm already worrying about all who knows what's going on yeah between the office or materials not being able to be delivered or whatever it is a bad sight meeting with the client like I don't care like just I'm not thinking about it and they take advantage of that right it's a shame man because there's an opportunity to actually do some good work big time right and learn and learn right yeah and actually learn that was one one kid at the very start when I got started in construction you're there for eight hours man yeah you might be able to do something might as well learn yeah ask questions pay attention yeah be a go-getter the guys that want to hide and be on their phone in the corner and this and that like you're making your day drag on yeah if you really don't want to be here do something your day's going to fly by how many times we have we started and I go oh my God it's already like 11 o'clock I love those days I could tell because my stomach what time is it oh yeah it's lunch time now it's time right but then you also got a lot of work done a lot of work done that's the best when you got everybody on the site and everyone's working everyone's in the groove isn't it amazing and then you pull off yeah more than what you expected to pull off and now you had a huge production day yeah I love those days I found a good way was uh I would tell them you know let's get this Corridor done we'll do high rise get this quarter all the lights up today we can go yes right Friday afternoon Friday morning let's get this done let's get out of here oh man you've never seen these guys work so fast in their life because they want a boogie yeah they want to get out of there and enjoy there's nothing you can't do is oh you can do it yeah I don't know I've never had that in me not to have that Drive I don't know I mean okay so you're a different generation but it's there's a stigma still attached to the generation that's coming in yeah so I I guess they still trying to figure out if they want to do it yeah or they should not be getting coffees for everyone every day or why am I always the guy going to get coffee I still get coffees for everybody I love getting coffees I get to go away get away from work I remember from my form and he had he took a long time to to find out but every day he would send me to go get morning coffees and I always take his change and get a bagel and I would eat the bagel in the parking lot and then I would come back right I laugh when I see these kids come back in like six minutes like dude pace yourself oh crazy lineup crazy limo tomorrow man yeah that's a good man absolutely so where have you and James talked about where you're gonna take the business yeah we want to um I love residential residentials no problem love Custom Homes I love the stuff that these clients are coming up with now the clients are the designers both or Pinterest or house yeah both right like the new stuff coming out uh everything Wi-Fi all this low voltage lighting controls and just everything's out there it's just a matter of options man a lot of options right I like that about Custom Homes how different even though yes you could have uh 3 000 square foot house this one and this one could be two different things right so I like that part of the custom home stuff uh commercial though I was kind of stick to the commercial I love commercial it's obviously what I'm most comfortable with um I'm Custom Homes now are residential now that we got the proof of it they're easy for me um but now you guys are I love the big stuff though yeah give me you know you want to get into the the high-tech stuff for yeah we got some big stuff coming up for next year um there's actually going to be can't talk too much about it but it's gonna be like a press release on it um that's big yeah it's gonna be already no commercial commercial yeah it's gonna be right downtown um and yeah it's gonna be it's gonna be cool that's gonna be I'm excited about that job uh but I love I just want to get bit I love big big electrical stuff you know 4 000 amp Services transfer switch I love all that stuff what do you think I know this has been a question that's been asked quite a bit um first of all Toronto doesn't have the electrical infrastructure to sustain if everybody switched over to an electric vehicle in every single driveway no we don't have that we barely have now with how Toronto I'm talking about Toronto with streetcars the way the whole electrical infrastructure is built right now it's it's it's archaic yeah so what's going to happen if that does happen where you start getting 50 of the population with EVS I asked um I don't know who he was if he actually worked like if he was an engineer for hydro in Toronto but I brought that up to him I'm like man your infrastructure is so old and you have some of these houses that are being put in there you're taking I don't even care about the house side of things that's just one house but what about all the parking lots downtown that could turn into 47-story condo buildings the power that's consumption right and that's on every corner in Toronto now yeah right uh I did a lot of work downtown Toronto at like Queen's Park and I remember I loved parking at the bay in Dundas parking lot and I hadn't been downtown for so long and I was down there to go look at a job and it's gone like that was my spot oh no what happened to it oh you remember every single parking spot that you could park at they're all gone it's all a building now every single one of them they're all building yeah and all condos and there's that's a lot of power consumption right so his answer was just kind of we don't know yeah like we're still we know it's going to be a problem or we don't care well they don't care I don't know if they're going to figure it out it's too expensive to change how are you gonna rip up the whole city you can't right so same thing with all sewers and it's not just electrical it's sewer so it's a constant repair it's a constant Band-Aid Band-Aid that's all it is that's what it is and you're reacting instead of being react you know proactive but I mean that that's that's the bad way of doing it now do they know Toronto is going to explode like that 60 years ago I don't know it's a major Metropolitan City it is so somebody awesome 25 Towers uh leaving The Exodus Medina someone authorized this or someone had a big fat manila envelope with money in it yeah and authorized these buildings to be structured there and then have one exit to get on the one main artery out of there yeah like come on like you got to figure out that this is gonna just explode and now they're taking over the Green Space right that's a different that's a whole other it's just it's just it's sad that it's just money driven it's not it is but then you look at other countries like at Sweden or whatever and they look at they don't have any debt they don't have carrying everything's infrastructure is all beautiful it's set up it runs everything works why aren't we paying attention to that why aren't you looking at other cities countries my dad and my mom just went to one of those uh River Cruises the European river cruises really yeah where um it was they went down that must have been cool yes it was in the Danube River okay so I think they did like Prague and Germany and like you Switzerland yeah so you come down the river so anyways my day in each day you stop and get out and do your thing and my dad was saying like dude you have no idea like even in Paris he took the subway like you missed the subway two minutes later there's another one coming have you seen Paris at Subway man he goes it's no but he goes it's what we have is such a joke it's like a spider web he goes even I think he was in Switzerland maybe links with Switzerland or maybe Germany like the streetcar system they have is unreal like we're so far behind I know like Europe is on point which is a shame because they came here to build the new world yeah and then they kept on building correctly and we kept on building incorrectly starting from incorrectly now yeah which is such a shame right yeah so it's like it's I I don't even want to be here because you don't see how it's going to get improved I don't know I don't know how it I don't that's what I mean I don't know how they how do you even go about that you can't the major Metropolitan say like hey guess what we need to to rip up everything and everything else is there for the major part like most expensive places to live yeah where like how the cost yeah it's insane but you don't have the infrastructure to carry all that [ \_\_ ] materials at all-time high labor at a high rate that's right you guys are all everything's kind of still reasonable or still stupid is it leveling out I think for me the stuff that I get but I try also kind of um the supplier I work with has been so great so we kind of you know if I kind of use you you know my loyalty is more to you of course and let's make a kind of a deal here on do things in bulk right buy things in bulk and so there's there's savings there um I think Romex is still crazy expensive though Roblox is crazy what did I get the other day I was doing oh a hot tub and I had to get some tech cable I think it was like 20 something dollars a meter no yeah six three Tech I think was like 20 bucks a meter 22 dollars a meter and I think I remember looking before I was like 12 13 demeanor yeah are they just price gouging us I was looking I was watching it's funny you say that I was watching at CP24 today okay and they came up because all the banks are releasing this week their profits okay um their bonuses yeah so they're Q3 right um Scotia was crazy and all these all of them they've never been in the black the one that started out yeah was the oil and gas did you I don't know if you saw it no it's depressing to watch one thousand percent increase over last year profit so why is it going up because they got to maintain those bonuses right so next year they they need to do more than a thousand percent they had to do two thousand percent yeah right it sucks so I I thought that was pretty disheartening to see to read that right you're making a thousand percent over last year so and like we're talking about billions of dollars trillions maybe right they didn't give a number they just give a percentage there it is it's a bank robbery yeah everybody's just taking as much money as they can while shit's going on just keep on grabbing the money bags yeah and then the homeowners think that you're you're you know using that as the excuse but as trades people we come in and then we're the the punching bag that can you lower your price can you lower your oh yeah price right you have the guys who um sadly um you know you see them you see them on Marketplace or Kijiji uh so I had one I I quoted a job to do I think it was like 60 polites in the house they sent I said give them a call everything was good they sent me a snapshot of the Marketplace ad I think the guy was doing it for thirty dollars a polite to install to install stalled labor everything 30 bucks how how is he doing that well I told him I said first off he's probably not using a CSA approved LED light he's probably there's a lot out there now you can buy that you can buy probably buy them three bucks four bucks right um and they're not the ones that I use right um you know just they're probably not getting an inspection done they're probably there's probably but it's not Apples to Apples how would that work in if a homeowner install or a homeowner gets a tradesperson to install that they paid for that product it's not CSA approved and there's a fire and the insurance finds out that that pot was not CSA approved is your insurance claim now void I would think so because part of when you get your license um part of esa's rule is that you're not allowed to install on um unauthorized unauthorized CSA UL you're legally not allowed to install it and you'll get a defect from Esa so technically speaking if you do because it's on us right exactly yep so you know and I try to explain people um I don't know I think we talked about it yeah on the phone one time but there was a point where you know I was really trying to explain to people and educate them um what what what the difference was did you get it I don't think they care I think it's the bottom line that they can't get as a fire they'll care until the fire happens yeah once the fire happens they'll care but up until that point well I got 60 Pilots for a third of the price or whatever it is right I said to the one guy and it sticks out in my head um I said you know do you have children he goes yeah I have two little ones I have two little ones too um I don't care I don't care if you go with me I just don't want you to go with him right call around call other people companies that are on Google call them uh not Marketplace or anything like that um because you know first off you have two children in your house and also your house is probably the biggest investment in your life right now um what's going to happen when God I'm not saying he's going to do a bad job maybe he's the best electrician he just wants to do it cheap I don't know he's a nice guy um what are you going to do then when the insurance tells you sorry um based on our investigation there's no permit you have Pilates there's no we never knew about politics the other thing is a permit yeah permit voids your insurance claim yeah if you do not get an Esa permit or a voting permit and they find out it was alterations which you'll know right away with polites yeah right um so are you willing to take that is that really worth that like a lot of people are we're talking about hundreds of thousands of dollars here they're totally willing and I think God for you know I took it to kind of The Next Step because I said God forbid something happens to you or your family yeah would you live I couldn't live with myself thinking something happened but all these Marketplace Kijiji guys are right they're making a living from it and and I don't know what other electricians out there that you're talking to are saying but um they're killing it I think every homeowner should do their own homework and find out like if you've gotten two quotes yeah one let's say it's yours it's legit everything's all in line and you got another one from that's like dramatically lower you have to tell yourself that you have to get at least two more quotes yes at least two more quotes yeah because if those two quotes skew towards the cheaper guy okay then fine this guy is given a bad price yeah but if they're skewed towards this guy yourself and it's in line it's funny then that's that's the really discounted guy is wrong yeah and then but they don't want to hear it maybe they don't want to cover it no and then you know what after a couple times I I stop you know I stop uh got Spectators yes [Laughter] um you know I was I just stopped trying like this is the price there's only so much you can tell that you know homeowners in Indiana I get it I'm a homeowner yeah I have a budget right but to me if it meant holding off for another three months and saving and being able to get it done that way that's what I wanted to do that's what I've told clients all the time if you can't afford the right price that it's supposed to be yeah then you wait yeah but nobody wants to wait everyone wants to they want it now it's not we're wishing that there was going to be an accident just to go I told you so I'm just saying we don't want that accident to happen yeah I I hate going out and bashing other guys that's not me I don't want to start telling you everyone you find on Kijiji or or Market there's good guys out there that are just trying to yes get things going right get your name out there and but man it doesn't make the math doesn't make sense and you don't need to be even just as a home or think how much does a guy get paid an hour it's going to take him a day you know three days 20 bucks or 30 bucks I think it was 30 bucks I think now I saw one the other day for 40. so we can they're slowly increasing but you know so just do the math yourself you don't need to know anything about anything a role of Romex at Home Depot cost me let's say 280 bucks for 150 or 75 150 I think it is okay 280 maybe I think 300 huh yeah remember it used to be like a buck a meter 90 cents a meter or something yeah yeah so um you know so let's say don't forget so you need couple rolls so you just start doing the math something doesn't make sense here and you don't need to know anything about electrical to to realize that you know and you have a professional who's trying to explain to you I'm not trying to upsell you I'm not trying like don't go with me but just don't go with him just get two more questions go out call a few more people Google electricians in my area go on home stars go on and then get two more calls from there right so or then they want to beat you down and do cash right ah yeah cash jobs it's it's almost the same evil at that point yeah right it doesn't work yeah but then again I don't get it it's their home their family's there they're there I don't understand the cash game anyways because really as the contractor whether your electrician to see anyone like cash is probably the worst possible deal you could do how are you recouping all the HST that you paid but everybody you know well they're hiding it somehow yeah you fool around with it but you know what I mean like you're paying taxes on this material and you're going to take cash like I don't know there's still a record because no matter how you slice it you have to get in a permit electrical permit to do the job right right so that's the first thing you're doing this other person is probably not doing that no so once you have a permit and you have scope of work then you gotta document what's going on yeah it's the one thing that I had the hardest time coming from commercial to residential was like competing with those types of things because there's a lot more in residential huge to the point where like it's not even like to me like I get so frustrated and and like you just feel beaten I spent all this time on on Saturday morning I drove out and I quoted it and I gave like such a fair and honest price um to the point where you're already doubling like questioning like oh yeah that's the number good too high then you give it to them and then they come back and it's like a third of it's like man like I just spent eight hours of my time and it's happening every single time you go out or not every single time but a lot more than not because I only wouldn't do it you know all you can do is just say no and go to yeah you know what unfortunately I think the guys out there too I know a few newer guys I think when they get slow they get scared so they they'll just eat up like take whatever yeah you know he did it for 300 yeah I can do it for 300 you know he'll do that but then it's going to start as standard right now homeowners like oh yeah see I told you to do it for 300. I just don't know how they're made the only way they're making money by pricing it that way is that they don't have anything legit so they have no insurance for their business right they're they're maybe not even certified they don't have a license so they're not getting their permits so they're they're rushing things they don't have to wait there's not the procedure and then there's no warranty and there's no guarantee that if anything goes wrong they're ever going to come back right the number you reach is not in service yeah doesn't care yeah and then God forbid something happens your insurance says sorry and then it's on the homeowner now what are you doing you got half a million dollars to to knock it down let me do a little green book talk here potential hazards of PVC wire insulation did you know this it's dangerous no this is right this is right right yeah many electrical wires are insulated with polyvinyl chloride oh yes another PVC PVC contains dioxin uh one of the most toxic chemicals ever produced that's lovely U.S Environmental Protection Agency the lovely EPA suggests that there is no safe level of dioxin exposure thus any dose no matter how low can result in severe Health damage including cancer immune system damage and hormone disruption PVC is flame resistant but when accidents happen the heat from overloaded wires and faulty wiring can cause the plastic to melt or even burn melting PVC releases dioxins in the air they have long-term effects on health when inhaled and the immediate danger however occurs if PVC is burned when burned PVC releases toxins hydrogen chloride gas and has been known to kill those caught in house fires before the Flames reach them that's right chemicals man chemicals it's dangerous Matt what else you want to chat about as we get close to wrapping it up it's already that time yeah oh my gosh I got a little timer here man yeah that's great no it's just uh I know that uh I I like that you have a lot of Hope for the new generation I do right that's good to see in here yeah I'm excited to see the stuff even the the new generation new things coming out you know these these kids are smart now my kid knows how to go on my iPhone he's four years old right he knows how to work YouTube so yeah you know he's probably gonna be an engineer maybe he goes right but these kids are smart now you know and and uh I'm excited to see what kind of things they come up with yeah well the industry the technology that's coming out they're trying to figure things out yeah we're getting closer and closer to George Jetsons and all that automation stuff and yeah come home and you start speaking to everything and all that [ \_\_ ] right have you um have you ever done many have seen many of those um I think they're like Leviton panels I've seen them have you done this I haven't done anything yeah it's just it's way out of my clients price range yeah it's way out pricey it's six figures man when you start getting into that world versus when you outfit a house these days average is what maybe a two 2500 square foot house you're in the 60k 70k to wire a house yeah now you want to bark that number up to 250 then 300K I know clients are not going to easily buy that it's cool though it's it's extremely cool extremely cool you can read all your power consumption you can you can mess around you can everything all by your phone or buy a panel a bunch of stuff no they're very cool but it's so expensive that's the stuff that's the problem I want to see this stuff start coming down and we can start doing a lot of I don't think they will I think that they got their niche market yeah and and you know if they sell one or two a month and that's what keeps them going you know whatever that obviously they're hitting that quota wasn't that the thing with Evie and Tesla like weren't their price supposed to drop that's right I thought the more it was like the opposite the more people were buying the less they were going to cost to build yes but that hasn't happened no it's the same thing with home automation it's a perk yeah so if you're charging so much why would you drop it you're going to make more money if you keep it it's costing you less to produce it yeah but we're not going to drop the price because whoever wants it is going to buy it the less you sell it's actually more expensive for you right what do we know it's good it's good that you got that optimism in there man I think a lot of electricians nowadays are seeing a really good amount of positive yeah kids that want to get into the industry yeah that's true I think kids are excited now too with with all the yoyap stuff and yeah you know I think it's great you don't know what to do go into oh yeah do electrical do HVAC do gas fitting see where you like why not and and go from there it doesn't matter you know even if you do three years of electrical you don't like it jump into another one you see guys on trade oh I like what he's doing okay go check it out you can jump on that one as well jump on it you and James when you guys take on your first Apprentice what's the first thing you want them to do on the first day what should they do I want shouldn't they I've talked about James because James is obviously younger yeah so he's he's not his whole uh he calls it old school my old school he's in his 20s I used to hacksaw he doesn't know how to use that he actually used to hacksaw a couple weeks ago for the first time he had to do conduit and he forgot his Sawzall somewhere or bandsaw he goes oh I don't have my bandsaw okay no problem I have my Sawzall oh Sawzall I don't know I don't I don't think he his dad took it of his truck or something so he had to go to the supplier and bought a hacksaw and he called me like oh this was [ \_\_ ] going on with this I said too what you got to move your arm yeah right so you said he struggled but I thought it was pretty funny I remember using hacksaw for four inch pipe and double unit strut and I got a funny story about a hacksaw where we were doing a standby generator I was fascinated because I was curious about it yeah so we had the tech cable yes it was a big unit yep and The Apprentice was there and the electrician said cut it right here marked it on the tech yeah you know where this is going right yeah so he marks it but he cuts through yeah and hits the wire no no no no this is before it's being installed oh and so this is the final connection to the actual generator okay so it's you've got to cut through here but you have to cut the sheath in yep so he just cuts clean right through and doesn't leave the sheathing like he doesn't remove the cheese so he cuts he's so he's basically four or five inches short now and he can't reach the generator generators parked hard pipe with gas yeah so on a patch and then I always like oh he's like huffing and puffing he wants to say but he can't say he's one he's to say and I was like what happened he goes no no don't worry man you didn't see anything it's all good it's all good whatever just tell me what the hell and he tells me what happened I was like what do we do now man so they try to Jimmy the tech the whole house to try to get certain ways if we go this way longer it worked but I mean you literally had to like it was right through the whole wall right this happened it's happened before but I never do it again the kid just like here cut it here didn't think about removing the sheathing that's right and having the extra cable to do the final connection he just you said cut it here right and that ain't a cheap wire either right that was uh it had to been about an inch and a half Tech I don't even know what size so we do we were the biggest one I've done is 750 it's probably about three inches yeah it was not that big it was but uh when you get like in and that's copper you a commercial we do a lot of aluminum but and he was grimacing as he was going with the hack and you do cut in you do copper it's not a good feeling right texts are all aluminum right yeah nope no they're copper I do copper yeah it was probably copper a lot of the generators want one coffee he did such a good job of fishing that whole line from the panel all the way through all the studs and like I left them just enough space to get it so you wouldn't have to fight it and then get it there and then he cut it right here and then he cuts it short it all fell through yeah but little things you learn you'll never make that mistake again I think someone told I don't know if it was like my grandma but she said the difference of being foolish and stupid is a fool will make a mistake being stupid you'll make the same mistake twice yes right so yeah I'll never get mad at anyone even when I was a foreman about messing something on site if when I come and you tell me that it happened and you can give me an a logical answer like I thought okay I could see where where you're getting you're wrong but you you have to make this we've all made mistakes of course right so as long as you learn from it let's just move on and get it over with that's it Matt now I got to do the 12 questions with you you ready for that yeah sure I just want to share everybody again triple wmjelectric.ca email is McCarthy at MJ electric dot CA and also info MJ electric dot CA and on Instagram it's m and the word and J Electric what is your favorite construction word my favorite construction word I didn't even uh pair anything you don't have to prepare thought about this I just asked I send it to you I send it my favorite construction word would have to be send it what is your least favorite construction word so cliche like can't it's true it's not cliche what turns you on in construction a nice pipe run you get like 10 pipes together all water falling down the same same bit oh I know all lining up space the same the turns are just oh I know it looks it does look beautiful man yeah and those are still exposed in commercial applications always but when you get to elevator at room or mechanical rooms what turns you off in construction just grumpy people bad attitudes miserable to be at work then don't be at work quit quit don't like it I'm not asking you to be here go get a job at the bank yeah what's your favorite curse word It's gotta be [ \_\_ ] sakes what's your favorite vehicle anything in the world just went out to a clients they had a um Porsche GT4 it's nice beautiful not really Porsche guy but that one looks nice yeah I know yeah I know it makes you look yep makes you look what's your least favorite vehicle [ \_\_ ] Honda or or BMW Honda or BMW they drive me crazy really yeah either or either or they're both the same category get out of my way what construction sound or noise do you love man the nailer gun oh no you know what I really liked what I changed my answer coming on site in commercial like we do high-rise mid-rise and you get like 20 drywallers on the floor and then all the screw guns the Rhythm you hear that sound and there's like 20 of them going and it's just everywhere I don't know why I like that it's nice like production yes it's really smoking mirrors it's just a screw it's production it sounds like a lot's happening no it does because you can go upstairs and see just metal studs yeah and then by lunchtime you're it's half covered yep because they just Boogie yeah they have the wires that's a whole other thing what construction sound or noise do you hate when drywallers or framers whoever's doing the steel studs use the friggin um hand saw they cut the circular saw have you ever seen that it's like yeah I got like it's a beaver electric yeah like it's just like it just chops it up yeah what's going on but it's like that's that sound that high pitch because you got the metal blade screaming with the flexibility steel stud oh man why do they do that I don't know and what type of like big companies here like that have all the tools they don't want to get the proper saw oh the guy's just too lazy a circular saw here on a steel stud what profession other than your own would you like to attempt oh what would I like to attempt give me a sec sure you could do a gas fitter Gasser yeah what profession would you not like to do plumber you don't want to be a plumber service Plumber where did this rivalry come from between nothing but love for me nothing but love but there's like something I think it's just like uh you know over the over the years of just Rising I think it turned into something that's what it is right I don't mind I could do new Plumbing but send me on a service call like I you don't want to that's not no that's not for me a lot of money yeah and so they absolutely they should they should bombers and Porsche they deserve everything buy them yep they drive them yep they enjoy them they deserve every single anyway [ \_\_ ] every day yeah last question If Heaven exists what would you like to hear God say when you arrive at those Pearly Gates good job man I totally forgot to ask you are you Makita guy no Milwaukee um mostly DeWalt mostly DeWalt Sparky yeah um don't know where that came from yeah I think when like when I started my that forming must have been the DeWalt guy and that's how it so it's just cheaper now to buy the bear tool like I have gazillion batteries uh I do have some Milwaukee stuff we just bought the Milwaukee 10 ton punch electric punch for panels and boxes and stuff it doesn't know what that is from half inch all the way to four inch holes for conduit really yeah punch how much is that thing it was a 2400 bucks but you use it we'll use it you'll use it battery operated battery yeah M18 yeah wow heavy um reasonable the whole case as a set is heavier than sin wow but uh yeah it's not bad 2400 though well you'll pay that off and no Pro like one job one job yeah one job you can you can punch out 30 holes in five minutes wow by Haley's do it by hand right the the ratchet the Greenlee ratchet or guys put them on their impact that drives me crazy you're making the tool cry yeah the Tool's not designed for that I said man she's looking too old for this there's tears coming out of that truck right now forearms cramping I know then you gotta get a piece of conduit and put it on the handle to give leverage you're smelling smoke yeah so you're not seeing it but you're smelling it and you're like looking around is that me the tool is crying and smoking and yeah why are you killing it man guys that don't use cutting oil or I'll just get a new one so that's it man but we'll see Matt thanks so much for being on this thanks so much for having me this is thank you for the gifts and this is absolutely honestly man honestly like dude come back anytime you want to come back love it we'll bring James next time yes it's not a better voice than me does he absolutely what's he gonna sing probably a little bit of ABBA or something it's too young to be Abba he called the other day all these uh forget what song was but what is it I was talking a young body what's going on there all these yeah he called me oldies I was like dude I was like in grade nine when that came out I'm offended deeply offended everybody check them out M J Electric uh triple wmjelectric.ca and McCarthy at MJ electric dot CA and info MJ electric dot CAE and it's on Instagram M and the word and J Electric and you'll do any work you'll come out to Toronto absolutely all the Toronto area yeah and also out in Kitchener and Waterloo area anywhere for anybody who was listening kw's kitchen or Waterloo yeah we've gone up to French River really yep wow you guys are Community clicks on the Ford that's a rental that's a rental a t-boned yeah seven months ago I still have a rental it's the same thing with Steve Steve had his rental for the longest what's going on with the how come the trucks are not just busy someone taking your chip or something like that and yeah so they wrote a total loss wow I just got the track cashed a few weeks ago for the the payment and just being too busy so now you gotta go buy a new truck yeah what are you gonna get same I think uh 1500 let's look at the 2500 but I think 1500 is better they're still 90 grand 80 grand I found some yeah but we need 82 79 so nice Dodge 1500 yeah get a few bells and whistles on it that's it yeah bro thanks man thanks that's it thank you Angelina we're out of here love it bye [Music] [Music] foreign [Music]"

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"VideoID": "1119",

"Title": "How to Estimate Residential Electrical Demo",

"URL": "https://www.youtube.com/watch?v=6CPwLjBXX9Y",

"Keyword": "Residential electrical construction",

"Transcript": "in this video I'm going to explain how to estimate demo or demolition for a residential job when you have to estimate demo there's a couple different things you can do the simplest thing you can do is is simply to look at the blueprints and determine how many hours it would take to do the demo and then input those hours manually let me show you that now first thing you want to do after you've determined how many hours it takes is come into red Rhino in a section here and click the add labor button at the top right I'm clicking the add labor button and it opens or populates items to the take-off now as I said the simplest way to do it is just to determine how many hours it takes so what you do is type in the description here I'm going to type in the words demo then I'm going to put in a quantity of two let's say I think it'll take two guys four hours to do demo I'll put in a quantity of two and labor hours for four four hours okay so again in this in this explanation or description I'm imagining that I'm a estimated a project for demo in residential I think it'll take two guys four hours so I type I click again to late add labor button type in a description demo type in quantity to four hours and then click Save of course yours could be different depending on how many hours you think it would take now if you have a lot more items to demo there's a more complex way that you can do it and let me explain what you can do is just make a material list of the items that you have to demo and input that list I'm going to make an entry here and show you what I mean now this is going to be a very simple explanation but I think you'll understand my point so let's say for example on a residential project that I have to estimate to demo a bathroom fan okay so what you do is you drill down in the product catalog or the assembly catalog in this case I'm going to go to assembly so let me just do that I'm going to click the drop down here I'm going to select assemblies and I'm going to drill down into the residential assembly catalog okay so in 100 is the residential assembly catalog now I said that I'm going to estimate demo of a bath fan okay a bathroom fan so here's the category right here it says bath fan over here I'm going to click on it and it'll display the different assemblies there in red Rhyno for bathroom fans I simply scroll down here and looking for the right materials I see the residential 15 amp residential exhaust fan I'll put in a quantity of one okay now I have to scroll back up and I'm going to click Add to populate the assembly into the estimate now here's the trick to this it's really simple in when you're doing demo it doesn't include any materials so what that means is the first thing you'll do is you'll come in here and you'll zero all the materials so I'm clicking in each box here and I'm going to make it a zero it's kind of annoying that my computer is pre-populating these I'm I should shut that feature off but I won't do it right now again I'm gonna click in each box and I'm just gonna zero the material cost because when you're doing demo you don't need materials okay it's just labor okay so I'm gonna go in here and zero each item there oops okay I typed in two oh in stead of a zero so let me type in a zero you have to have five by the way that's that's a good lesson you have to have a zero value here okay if you just make this if you just delete the numbers in here it will not allow you to save it okay you have to at least have a zero value okay so I input this assembly it has some materials in their eyes zero the materials now here's the other thing I do I go in and just make the labor one half of what it shows okay sometimes I might just choose to zero the labor completely but in this case see how it has a half an hour point five hours for the bath fan I'm going to change that to 0.25 which is half of 0.5 okay now this was just point zero four hours that's just a couple minutes I'm going to zero this one is 4 point 4 hours per thousand I'm gonna change it just to 2 hours ok well let me see I'm gonna make it 2.2 hours ok you get the idea what I'm doing is I see I input the materials that have to be demoed by 0 the material cost and then I go cut the labor in half I make the half labor one half of what it showed before now this is just staple labor I can leave that because it's not very much or I could make it a zero ok and then I click Save ok so that's it in a nutshell when you're estimating a job with a lot of demo you might just go in make a material list of the items you have to demo in put those items change the unit price to zero and and just make the labor one half of what it shows let me just show another example I'm going to use the example that I have to demo a two gang switch ok a two gang 15 amp switch so on this screen here you'll see I already drilled down into the switch assemblies I just go down and find the assembly here we go there's a residential two gang one 15 amps which I'm gonna put in a quantity of 1 say after demo 1 I'm going to add it and again I just go through here and zero the materials so I'll do that real quick I'll zero each box for material ok here you see that I zeroed all the materials and then again I just go in and make the labor 1/2 or you know clothes counts on this guy's you don't have to be exact again the idea is the labor takes about half as much time to take things out as put them install them so just get it close in this okay this one is 0.1 hours I might just make it point or point one eight hours right here I'm just going to make it point one the next line item here shows point that's for the the switch actually switch installation it's point one four hours I could make that just point zero seven you get what I'm doing here now the switch plate I might even just make that zero hours okay I wouldn't try and split point zero seven hours but I'm just going to make that zero there you go now the next one shows four point four hours and that's the romex that's included in that assembly so I'm assuming that I have to rip out the romex feeding the switches to so I'll just make that half it's two point two three okay I'm going to change it to two point two three and the rest I'm just going to change to zero okay so there it is complete okay so you get the idea now when you're all done you just click Save and go on to the next item so sometimes if you're if you're rewiring a house or rewiring completely like a room addition or if you have to remove an old service and input a new one you would just go in put all the materials for that service to estimate the demo again zero the materials make the labor one half of what it shows and then go back and add the new service for the labor to install new hope that helps that's all for now on this take care"

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"VideoID": "1120",

"Title": "#electrical #tradesman #bluecollar #electrician #residential #sparky #diy #viral #comedy #trump",

"URL": "https://www.youtube.com/watch?v=Zoqss1VO1lo",

"Keyword": "Residential electrical construction",

"Transcript": "lame scared boring rookie whack [ \_\_ ] lame [Music] dick sucker"

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"VideoID": "1121",

"Title": "Electrical Construction and Maintenance Electrician Tour",

"URL": "https://www.youtube.com/watch?v=TbCET6Dkpb0",

"Keyword": "Residential electrical construction",

"Transcript": "hi everybody Justin here at the Pioneer Student Union on Alfred State's School of Applied Technology campus today we're going to be taking a closer look at our electrical construction and maintenance program instructor HC Willard is in our first year electrical lab right now and ready to provide us with some more information so let's take a short walk over hi I'm HC Willard an electrical trades instructor here at off at State College and our program for electrical is one of the best in the nation now you tell you it's two years the first year we've built we set a foundation of electrical theory and we build upon them we go basically from no voltage to a low voltage that's this doorbell system you see here this transformer only has 24 volts we want to make sure that everyone knows how to use this safely before we get to a higher voltage we understand how current flows we understand what the amperage is doing resistance voltage and wattage we try to make sure that everything you do from here on out you know exactly what you're doing you know exactly what's happening in this circuit so once you understand this we can go all the more we've a little bit higher and we go into the line voltage recessed residential our first tier is all about residential wiring that's why we do doorbells we also do switches and lights outlets we'll use all these things so you know every facet that happens inside a home all the way up to panels and meter sockets the services are very very important to us so our first year we not only go over everything from resistors to doorbells to nm wireline voltage where we also been in convoy you know I'd be wondering why do you do bend conduit when we're talking about residential well make cities like New York City and Chicago they require metal conduit inside their homes so we teach you how to bend conduit we teach you how to use this bender right here manipulate this pipe so you can do things just like this it's so important we get a nice basis of money our trade is doing because everything that you do from here on out for the first year is exactly what you learn here when students are learning in this program is important that they're learning according to code is code taught within this program as well code is the most important thing to us here the National Electrical Code which is brought out by the National Fire Protection Agency Association they we are like the best way to put it is before firemen have to go to a house to put out a fire we are the pre firemen making sure that fires don't happen so our code is so incredibly important because it literally saves lives and that's why we based everything on that national electrical code and everything you learn from this first year you go on to the second you know the second year we call the senior year the senior year you get into very specific niches in the electrical trade so you learn everything from solar renewable energy wind turbines you learn programmable programmable logic controllers PLC's you learn pneumatics you know air using electrical with air you'll learn fire alarms which fire alarms are such a different breed to what we normally do and Hospice locations and we'll also learn motor controls motor controls being one of the I won't say more difficult but it's also one of the most profitable parts of our program so you see we learn our basics of theory we do residential and then we do these six different all classes when you leave this school you're such a well-rounded electrician because you know so many different facets of this industry that you can go to any jobsite and say I'll call a fight to work for you and that is exactly what we want for our students we specialize in well-rounded students because how we see it is any electrician can go and put some new circuitry in anyway really but a great electrician can troubleshoot something that's already there this is one of our troubleshoot boards for line voltage you see we have chain chain light here we've got a GFI three-way for three-way so there's everything you might see in a house we have right here and we can put in problems so our light works put in a problem all the sudden their light doesn't work anymore something's wrong we gotta figure out by using just our meters not taking everything apart but using our meters to figure out what could be wrong here could it be an open neutral to be an Oprah open hot can be an ungrounded but this is what sets us apart we build these things to test your knowledge of electrical Theory the students are going to get a lot of time working on projects here in the building in their lab spaces are there any special projects that they'll get to work on there are absolutely special projects the students get to work on here in the first year because it's all residential they actually get to work on a house the college runs a project that for all the trades to work on so you have everybody from you know building trades drywalling HVAC plumbing and then of course electrical yeah I have electrical of your houses so we get to go wrote the house we can put the devices in the service for the house complete an entire house which is really really nice because you get that sense of accomplishment when you're using doing these projects in the senior year they also have projects they have solar panels that go on buildings here around the campus they also have programs that have taken our students all the way to Washington DC to the National Arboretum where they wire to solar powered cameras that looked on an eagle's nest there so people could see their progress and they did have a few babies and on that it was very exciting a lot of hits so we do a lot of projects here in the building we do projects outside the building that way you get a real hands-on feel what a jobsite really is gonna feel like so our goal here is after 2 years you'll be able to do everything from residential to commercial industrial to do alarm systems basically you'll be able to leave this school and you'll be able to go out in the world and find a job anywhere and not only that I know that some of you might want to go on to be linemen this is a great foundation for that some of you want to be union workers great foundation for that this is a degree that will go with you your entire life but no one can take from you such an incredible piece on your resume we have students that gone all around this country with this degree and have had great success and that's what we'll be waiting for you when you come to Alfred State"

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"VideoID": "1122",

"Title": "How to install Residential Electrical Service 400 Amp",

"URL": "https://www.youtube.com/watch?v=pNhrmBRIZO4",

"Keyword": "Residential electrical construction",

"Transcript": "hey what's up y'all savasa with savasana's electrical so um having this 400 amp service here uh a long time i've been uh [Music] for me to build my career right so for a long time i've been trying to see when i can uh come out and speak the language of electrical right basically explain what's going on with this 400 amp service all right i'm uh basically explaining what's happening from left to right okay everything that's happening right here it's a lot going on so let me break it down okay this is a service being built for slimko power right so slim cool requires if we're going over 200 amps on the service it requires to put this ct can so this is a ct can with a current transformer performer inside current transfer inside reads the wire and that's how you get your beaded surface in the meter box right this is a meter box and it's basically going to read from this current transfer okay then we're going to shift over from that current transformer box and go straight to this 400 amp disconnect okay 400 amp disconnect this is a three-phase disconnect because that's all the supply house would supply but all we're using in here because of the fact that it's a residential service is single phase so we got our two hots in a neutral that's it and we got our grounding number two grounding okay wire size in this box is a 350 mcm 350 mcm what's the 350 mcm well it's a wire size to um basically carried an amperage of a maximum of 350 amps 350 to 375 is the maximum carry okay so next we're going to shift over and explain what's going on at this bottom right here this is a trough basically to be able to make like a distribution of the power to send the power to each disconnect so we got two 200 amp disconnects that comes off of this 400 200 100 100 i mean excuse me 200 200 equals to 400 inside here [Applause] is our connections with two art wiring and each one of these boxes is gonna feed each of our panel box it's going to feed the panel box that's more than three feet away from here which is way on the other side of the house we turn this disconnect on and that basically sends power to one this one panel box inside okay this other disconnect it's just a second disconnect we got two out wiring inside [Applause] we got our line coming in and this is our load going out headed to these other panel boxes inside okay at the bottom here [Applause] disconnects disconnect comes from the top polaris distribution block this is our neutral this is our one hot lane and this is day okay and then we got our grounding we got two ground rods in the ground basically the uh surface is gonna be fed from this pole here we're gonna have a transformer that's gonna be somewhere here that's gonna bring power all the way to here okay and that's my 400 amp disconnect and that's my 400 amp service i hope i explained this pretty good i hope my language sounds and makes sense no i'm not a play electrician i'm a real electrician this is for real um for many years we've powered up houses across the board and that's what we do and that's what i love that's my primary it comes down to electrical i know what's going on all right y'all that's my explanation of a 400 amp service"

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"VideoID": "1124",

"Title": "3 Red Flags When Hire an Electrician for Your Residential New Construction Wiring Services #shorts",

"URL": "https://www.youtube.com/watch?v=sbMhPBVBcLk",

"Keyword": "Residential electrical construction",

"Transcript": "three red flags when hire an electrician for your residential new construction wiring Services one if your electrician is not licensed to provide residential new construction wiring you could find yourself footing the bill should you experience any issues with your homes wiring down the road two you could find yourself up the creek without a paddle if your electrician doesn't offer any insurance or warranty for his work three if the electrician can't offer references or work samples it's also important to know what kind of work your possible electrician can verify he's done if you are looking for an expert electrician in neille ilil or the surrounding areas visit our site at Reliant electrical.com today to book a call"

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"VideoID": "1125",

"Title": "Residential Electrical Estimating Software - Using Assemblies to Estimate Residential Electrical",

"URL": "https://www.youtube.com/watch?v=1bWZuZVnXMk",

"Keyword": "Residential electrical construction",

"Transcript": "in this video I'm going to explain how to use residential assemblies on the screen here you'll see I have an estimate created and I have a section called room addition I'm going to go over to the right-click take off edit it'll open up so I can input some materials now again the basis of estimating electrical or estimating with red rhino is is to make a material list and input the materials into red rhino now I want to explain that that assemblies make that process a lot faster I'm just gonna put my cursor on this line right here and move it over what I call unsquare when I open this up it's showing the product catalog here and I want to explain that residential basically just lives in two places it lives in the product catalog under 6000 self-explanatory right residential romex and plastic boxes won't explain something with red rhino software when we're talking about estimating residential we always mean plastic boxes and romex if you're required to use metal boxes and pipe and wire for residential you would watch the commercial videos ok I'm going to go up here and click on the assemblies and when I do it opens up the assembly catalogs now self-explanatory here residential is 100 I click the plus sign next to that and it displays subcategories of assemblies for residential receptacles switches lighting ceiling fan smoke detectors low voltage doorbell panels and home runs dryers hot waters range of an AC etc ok so next we're gonna drill down into one and take a look I'm just gonna open up receptacles here I click on it and it populates assemblies at the bottom I won't read all these off my purpose in this is just show you where they are so you can learn about how to use them but let me just explain since we have pre-built assemblies in red Rhino then what I can do is just go to the blueprints or drawings and I could count all the 15 amp receptacle x' and I'd come here and put them in as an assembly now I'm just going to put one assembly in here of the 15 amp duplex one gang 15 amp duplex receptacle put wanna do one and click Add when I do it populates a list of materials this is the way that red rhino displays assemblies it shows a description of the assembly first and a dashed line at the bottom separating it from the next entry okay so I'm just going to click the Save button but I want to make a note of something or tell you something here if you choose you can go change any of these items before you click Save so I'm just going to go ahead and save it and then I'll describe what the outcome is so this assembly for a 15 amp receptacle displays one plastic box a standard 15 amp receptacle a plate 30 feet of row mix 8 staples some labor for drilling holes and some red wire nuts okay again that's the nature of these assemblies they include everything needed to do one thing next I'm going to drill down into dryers hot water and range and oven and AC so I'm going to click on the drop or rather click on it and it displays the assemblies at the bottom here now I'm just going to go in put one of these assemblies I'm going to input a 30 amp AC feed so I click in the quantity box type in 1 scroll up to the top click Add and it populates what's in the assembly in this case I want to show you something this is a case where you might edit what what the what is in the assembly in this case it shows a 30 amp disconnect switch a pullout type residential disconnect switch 60 feet or romex i'm going to go back and change that connectors to connect the romex look here a 1 pole 30 amp I'm sorry one two pole 30 amp circuit breaker some stapler staples have a hard time talking steel tight half-inch right with with connectors and wire and mounting hardware so again this assembly includes the disconnect switch the a homerun a circuit breaker and seal tight can to connect the AC unit now back to my example here I'm going to say that I know that this this homerun the panels more than 60 feet away I measure it I know it's an 8 90 feet so I'm going to change the 60 to 90 here okay so in these assembly sometimes you adjust them to what you know the conditions are of the job I'm just going to go ahead and save it and then when it saves I just go on to the next assembly I'm just going to show one more example in this video I'm going to go down the same category and I'm going to input residential 30 amp hot water feed with without disconnect so meaning no disconnect put a quantity of one in here scroll up to the top click add and it populates the material is now once again this assembly includes 50 feet of 10 to romex again you can change that if you know that it's different maybe or it's a different distance I should say in this case I'm just gonna say it's I know it's 40 feet so I'm going to type in 40 now again this assembly includes the plastic box the romex connectors a circuit breaker again steel flex for connecting the for connecting the water heater ok I scroll up to the top and click Save to save my assembly that's all in this video again play around with these assemblies and they really do speed up the time it takes to estimate a project"

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"VideoID": "1126",

"Title": "J. Becher &amp; Assoc. - Full Service Residential Electrical Contractor",

"URL": "https://www.youtube.com/watch?v=59KfkQtRfpk",

"Keyword": "Residential electrical construction",

"Transcript": "hello I'm Jerry Becker I started Jay Becker and associates in the 80s in the last 20 years Bob Wiley and myself of team Duncan and done a pretty good job we're a full-service residential contractor we started with houses we're gonna continue doing that as well we're also a full-service contractor we specialize in limited energy as well so we're a full one-stop shop the roots of our company go back to housing and we're huge home automation people we have a complete line of alarm.com products were Alon premier dealers we've got over 20 people that install you know our automation systems for condos and houses and we do hundreds and hundreds of those a year so we got this project Cowboys that in blue it's a three-story condo so you know all kinds of systems going in it access control and fire alarm and whole lighting control with a ulong system it's all custom by the homeowners we tailored to their needs we're very very proud to have over 550 days of no lost time on the job we're very proud of our core values of being the best and caring and doing the right thing you know our group is very hardworking and very positive as we approach the days so we have this big project building in Saint Paul was called the Dorothy Day Center they help people for housing for tonight puts a six story building it was the biggest job we've ever done electrically to appear commercial around 2000 or so we talked about being a part of power partners you know the reason that we looked at that was the complete inability to find great people and what we've learned through the years is that the IBEW nikka partnership of our partners produces the best people on earth the training at the JT C's is amazing the kids that come out as electricians today got this tremendous background in in history and safety training and they come out so far ahead of everyone else being part of power partners is is our future [Music]"

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"VideoID": "1127",

"Title": "Residential electrical panel inspection",

"URL": "https://www.youtube.com/watch?v=TzQ9knfLuBs",

"Keyword": "Residential electrical construction",

"Transcript": "hello I'm Henry Lucero on Rivera electric service when's the last time you had your main circuit breaker panel inspected is it properly grounded do you have whole home surge protection these are important factors to keep your electrical system safe and fire hazard free we specialize in circuit breaker panel upgrades surge protection smart lighting and everything electrical from A to Z if you need residential or commercial electrical service please call us at 817-538-8959 thank you"

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"VideoID": "1144",

"Title": "#electrical #electrician #milwaukee #residential 15 amp outlet part 3",

"URL": "https://www.youtube.com/watch?v=Ctk-kCI26Nw",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] ow [Music] he"

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"VideoID": "1155",

"Title": "Coday Sayso doin residential electrical work installing receptacles",

"URL": "https://www.youtube.com/watch?v=mQpR8G9kaAQ",

"Keyword": "Residential electrical construction",

"Transcript": "my packing work got my boy cody here you know i mean big electrician"

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{

"VideoID": "1163",

"Title": "#construction #new #light #electricial #electrician #sparky #life #power #bluecollar #residential",

"URL": "https://www.youtube.com/watch?v=UEYmrl\_\_XUE",

"Keyword": "Residential electrical construction",

"Transcript": "don't know a like myself I say selfmade meaning I design myself County Jail fade you can pull my foul yourself spy R swall rocks I'm getting high myself yeah damn right I like the life I built I'm from West Side 60 I might got killed"

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{

"VideoID": "1166",

"Title": "Residential Electrical Systems",

"URL": "https://www.youtube.com/watch?v=MUyhu77xa\_8",

"Keyword": "Residential electrical construction",

"Transcript": "hey everybody for this week's assignment we are going to be talking about electrical systems and how they are set up inside of some residential buildings and we'll talk a little bit about office buildings and commercial buildings too but mostly we're going to be centered in this on our residential style buildings so here you have our our beginning we're going to talk about these different things in the table contents here we're going to talk about the general electric system how electric service and power gets into your building and then how the power distribution happens once it's get once it gets inside the building with the wiring receptacle switches we're going to briefly touch on some electrical code and some electrical plans and then we're going to talk in this PowerPoint a little bit about energy conservation and then we're also going to talk more about that in the assignment later so what we have when we talk about the electrical system in a house is we typically have an electrical service coming in we'll talk about the details of it a little bit but it's 240 volts and here in the United States we use a system called sixty Hertz and that comes in through a meter and then it comes into the service panel and so you can't see me describing anything we'll show some pictures then in a second but that's what comes into your house first it comes into the meter so that the electrical company can tell you how much electricity you are using and then it comes into the service panel which is inside the building and helps to split that out then we go into the electrical wiring the building wiring and we use electrical boxes receptacles which are otherwise known as outlets and switches to determine where that electricity moves throughout the building we use that for things like lights and the other equipment that's powered by electricity almost everything in our house is powered by electricity nowadays and then there's other electrical system that are most of the time powered by the wall systems but then they do other things like the entertainment system and the telecommunications which would be like your telephone internet systems all of that stuff so like I said before electricity is supplied into a building via what's called a service drop sometimes that is literally hanging in the air outside of the building and you can see wires going on to the near the roof of a building and then traveling down the wall sometimes and in most modern applications it is almost always tried to be they try to bury it underground so it come into the house underground that service is three wires two of them are carrying a what's called a hot leg or a load on the the wires and then the other one is what's called a neutral or ground so it actually doesn't carry any voltage on it but it's the way to travel back to ground now we could have a whole twenty minute long conversation about just how that electrical service works but we're going to keep it rather brief for this assignment the building electrical circuits are powered by the difference between any two of those wires so most of the time when you plug something into the wall it is going to be running on a hundred and twenty volts so the difference between one hundred and twenty volts of the hot leg that the powered leg versus the neutral wire which is what the wire the power travels back on that's a hundred and twenty volts and zero volts the difference between that is just 120 volts 240 volts is needed for certain applications and appliances around your house such as maybe an electric water heater if your range or stove is an electric stove that usually runs on 240 volts and most of us also have a dryer in the house that is electric runs on 240 volts now if you have a shop of wood shop or some sort of other metal shop out your house there's a lot of tools that run off of that and again that gets into some more detailed stuff but if you take a look at my mouse here this pattern is what's called the alternating current that's why we're saying it's AC current up here this is what runs inside of your house the fact that it's alternating means that it's going up and down and up and down and this is what I was talking about the difference between zero volts or no voltage at all the neutral leg that's the Green Line in the middle if I'm looking at the red line here when it's up in this position the difference between the top of that peak and the neutral wire that's 120 volts and it just goes back to zero and then goes the opposite direction but if we use 240 volts we actually use both hot legs to make it so that we have a difference a total difference of 240 volts and that neutral leg might still be included depends on the wiring and depends on the appliance itself but there is a pathway back to ground which is the safety of the whole system then so this is the picture down here of your electric meter and how you are charged for your electricity through your house is what's called a kilowatt hour so all the things plugged in to every outlet in your house all get tallied up and run through this meter and that's what the electric company uses to charge you or obviously your parents to see how much electricity electricity you have used so power is the rate at which the energy is used and it's measured in watts and you can see that the energy cost is the power which is the rate over time how much did you use over that time so kilowatt meaning just a thousand watts over the hour so everything plugged into your house all at one time for one hour that's how you would basically keep that and keep that idea in mind another way to think of it really simplistically would be like if you turned off everything in your house nothing was plugged in except for one light bulb and this imaginary light bulb is a thousand watt light bulb and then you left that one for one hour you would have used one kilowatt hour to power that light bulb in and therefore you would be charged on how much that kilowatt hour how much the electric company is charging you per kilowatt hour so now you're inside the building and you have a power distribution which is the main panel in the building up at the very top of it is this thing called the main breaker so there's actually big chunky wires that are coming into the building and the very first place that they go after the electrical meter from outside is into this main breaker and that is like if everything that's plugged into the house all the sudden starts drawing more than this main breaker there's more power that's being used this main breaker might flip and then protect everything in the building from over current okay all these little circuit breakers down here each one of them allows individual circuits to be switched on and off like it says here but it all is a protective circuit so each one of these is rated for a certain amount of power and if that amount of power is exceeded then it will trip this off and it will not allow power into that circuit same thing with the main one up here if we plugged in a whole bunch of devices and pulled too much then the the main breaker can handle then it would flip as well so it's not just an on/off switch it's actually a safety mechanism mechanism as well but this is where everything gets distributed to the building and somewhere inside your house I'm going to have you try and take a picture of this I'm also going to have to have you take a picture of your meter outside but I want you to see this and then also see hopefully it's labeled properly that you can see which one each of these things turns on and off and where the power is going so inside the main breaker box and then running inside the building is all of this wiring it's almost always copper wiring copper is a very good conductor and it is a sheathed cable it has a plastic coating on the outside of it black wires are usually the ones that are called the hot wires they're the ones that actually carry the electricity white is a neutral wire so again that one is basically the same as this ground wire which is in green or sometimes just left completely bare and those two are the ones that allow that alternating electricity to go back down to zero and so the combination between in this case the white wire and the black wire would be a hundred and twenty volts because there's no other hot wire identified there so as electricity is fed to the device via the hot wire and returns completing the circuit through the neutral wire and then a ground wire is arguably the most important wire in that whole system because it provides that safe path if electricity is trying to jump around where it shouldn't it's if there's a short between the electrical thing maybe your your coffee pot explodes or your microwave starts sparking or something like that if there is a direct line in between these two then the ground would kick in and that's what would allow the safe path of electricity back down to somewhere else in the building where it's not going to catch fire or something like that a receptacle you've all seen and use these before you can see that they're identified there's a bigger slot on typically it's on the left hand side that is the neutral wire and then the hot side is on the right side and then the bottom part in this one is the ground socket just like this plug shows right here not every single plug is grounded so sometimes it's just a neutral and a hot and usually that's on a 1 an appliance that's a little bit lower power and doesn't need that ground so they're relying on just the neutral leg to be able to handle any sudden spark and electricity or something like that so the receptacle is the outlet connection to a powered device it allows the continuation of an electrical circuit through the hot neutral and ground wires into a cord and then the socket pattern corresponds to a standard and that neutral slot again is a little bit larger and it's on the left-hand side than the hot slot so if your house is not wired properly and those two are switched you can have problems because then you can get a little bit more electricity through the larger side and hypothetically heat things up a little bit too much and it can cause things to fail or it can cause fires there is something called a ground fault circuit interrupter and it's usually abbreviated GFCI and this is required by code by an electrical code in locations that are potentially wet locations so somewhere where water could get on or near that electrical outlet and they were so they are required for your kitchens and bathrooms and I'm going to have you again take a picture of this somewhere in your house to basically like get you to understand what they start what they look like what they do the circuit is opened in other words it is disconnected when a short circuit occurs inside this receptacle or any receptacle that is tied into it down the line so you can put this one in first and then you can put two other receptacles on there and if there is a short that happens meaning like there's a connection between the hot and the ground or the hot and the neutral that it's pulling too much power it will trip this little built-in circuit breaker right in the outlet before it even goes the whole way back to the main circuit breaker which is only looking for overloading the circuit so it's even if it wasn't pulling more than it needed to but if it sees that drop of voltage across those two then it will trip that little circuit breaker and potentially save your life so that you're not going to electrocute yourself now when you turn on a light bulb around your house if you have a single switch that attaches to one light bulb as in there's no other switches around your house that connect to this light bulb or light fixture or whatever it is that's called a single pull electrical switch it allows switching from one location and it typically is that the power comes into the switch and then the switch has a set of wires that go up to the light and this determines whether the power is allowed to flow through it so here's a diagram of what it sort of does inside of there a electrical switch has two states to it it's either open like this switch is shown here or it's closed meaning that that leg would actually be attaching on to here so when that's closed it makes the electrical connection when it's open it's not making a connection so that's what that light switch is doing it's just breaking or connecting all of the electrical wires inside of your house now that just like the receptacles are going to be located in boxes inside your walls there is a different kind of switch that frankly this is not super common at least in the Northeast where I have construction experience and experience in in electrical work where it's called a double pole single throw and you can basically see what it is it's like it's like having two switches right next to each other and so it goes and switches two lights from a single switch that's not very common however this next one is called a 3-way electrical switch and that allows switching of a single outlet a single light fixture from two locations and I'm going to venture a guess that you have at least one of these if not multiples around your house a 3-way electrical switch the switch itself is a little different inside of here again we could have a whole conversation about how you wire these up differently but that's for a different type of class and a different type of application but basically now I want you to understand that when you turn one light switch in one position it will either turn the light bulb on or off and then if you come to the other location you will turn it on or off as well these are typically used in hallways where you want to make sure that the occupant that's walking through the building can turn the light switch on walk their way through a small hallway and then turn the light switch back off maybe there's light switch right outside of a bedroom and then at the bottom of the stairs so that you can turn the lights on and off from the top of the stairs at the bottom of the stairs you get the point so electrical codes exist so that you can be safe and so that there is a standard of safety across everybody that is putting electrical electrical service into a building so local jurisdictions can you visually adopt a unique electrical code effort it has a unique electrical code lit it's Manheim Township all of these things they all have their own code but they can just adopt a national electric code and then have maybe some tiny changes that they decide to put in it that's a little bit different than than the standard there is also something called the international residential code which includes the the electrical requirements there now let's take a look at some electrical plans quickly in this plan what you see is a couple of different rooms and these over here I'm going to show you later that this has a legend that shows you what all of these different things are but the circles with the lines that are on the outside of the walls those are all receptacles these big rectangular things those are fluorescent light fixtures and then there is single light fixtures which would we we would usually call a can light which is like a recessed light up in the ceiling and then all of these little dotted lines that connect to the little s that's shown on the wall there those are all the switches and the lights that they connect to okay so if we take a look a little bit closer at some of these these have a single light in the middle of the room right here that just is attached to a single switch and then there is another switch that is located over here that that would go to these lights and then there are individual switches that go to these banks of Lights over here so all of these would be referred to as a single pole switch so it's just a single light switch and then it's attached to a single fixture now when we click here you see that there are some switches that have a little number 3 next to them that's this guy right here and that has a line going up to this light and then another line going back over to the switch this is as you may have guessed a three-way light switch so that this single light fixture is attached to these two switches sometimes if the electrical plan is relatively simple like this one showing just a couple of receptacles and some lights built in you also see that there's here in the middle there's a GFI outlet or a GFCI outlet that's 48 inches off the ground if there's some simple stuff like this this would probably be included in a set of plans just a regular set of plans for a normal builder if however there are some really intricate things going on with the lighting maybe there's some extra styles of lights going in maybe there are a lot of different varieties of lights more than just a couple of pictures can really show there might have to be an entirely dedicated electrical plan that is sent to an electrician that an architect helps to build with an electricians help so that they can plan out where all of the different outlets and all of the different lighting devices go inside of the building so here's that legend again this was the 2 foot by 4 foot trough for light which is just a big big in ceiling light and then there are duplex outlets GFCI outlets single pole switch 3-way switches ceiling light those type of things all right and then finally energy conservation so it's a really big deal to make sure that houses are being energy efficient or as efficient as they possibly can be you also just don't want to have to pay extra money in elect Oracle bills every month so whenever you can minimize the electrical outlets and recessed appliances in exterior walls what you're actually doing there is saving electricity in heating and cooling costs because the exterior walls you're basically putting holes in those walls and if you can keep them sealed up nicer and tighter then you're not letting as much air in you can install timed switches or a humidistat for exhaust fans in bathrooms and in kitchens and things like that to be able to ventilate the building but not leave them on with just a switch and then somebody forgets about it select energy-efficient appliances and equipment that you go that that's put into the house use energy-efficient LED lighting where it's practical and then we're going to talk about this more in the assignment but consider the use of day lighting which is something that you're going to learn more about especially in offices and commercial buildings so that's where I'm going to end this PowerPoint right here and then I'm going to set up a separate video that explains what you are going to be doing for your assignment"

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"VideoID": "1168",

"Title": "Residential &amp; commercial construction",

"URL": "https://www.youtube.com/watch?v=K2EyXOHxPvI",

"Keyword": "Residential electrical construction",

"Transcript": "[Music] thank you [Music]"

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"VideoID": "1184",

"Title": "Construction of Concrete Block Walls Residential Construction Start to Finish",

"URL": "https://www.youtube.com/watch?v=fJc4Sol1Yl4",

"Keyword": "Residential electrical construction",

"Transcript": "here she comes [Music] [Music] guys welcome back to the channel and welcome back to the building a home series very proud to uh announce that the block walls are up more so for me than for you but good for the youtube channel and before i start getting into all the cool footage i'm doing these videos kind of like a montage so if you're new to the channel new to the video series i kind of bs a little bit and then i just show all the footage um at the end of the guys working hard kind of in the phase of the completion of the project just to kind of give you guys a inside look at how it goes from you know one face to the next but what i want to do on this video series here before i keep rambling on is to go over a few specifics because this build is a little unique this build is adjoining one house obviously to a new house and then eventually this wall comes down so i want to go over a couple of quick points and i'm going to pipe in some footage probably now of what i'm about to talk about here so you'll see a guy drilling into the concrete block wall and what he's doing is he's adding steel into the existing house so he drills a 5 8 hole straight through the masonry adds a rebar with epoxy which basically bonds the rebar into the concrete and then brings it into the new cell of the concrete block wall and then ties all that together with steel then they pour and i'll cut in right now or might have been watching already they'll pour this solid this whole cell full of concrete and what it does is it ties the new block wall to the existing block wall almost creating a stronger joint than what's existing on the house so that's one of the things i wanted to note so we have that happening over here on the house and we have that happening up here in the front wall over here and i have footage here of the guys doing that so that's the first thing then the next thing i want to note as far as the construction methodologies are if we look down here remember those rebar that were sticking up from the slab you can see that's this rebar right here okay the one with concrete all over it when they poured then there's a new rebar which i'll cut in some footage now of these this long this is actually a really long rebar over 10 foot long that goes down the entirety of the block wall and then it's hooked in at the top of the block wall and what that does is it allows once they pour the whole entire wall the top of the wall and the cells with concrete is it creates a continuous tie beam all the way from the roof structure all the way down into the bottom of the foundation so what that is for is obviously for hurricanes and and wind speed requirements so it really it gets the house completely tied together so you'll notice here as i go through at the bottom of all these block walls you can see where they have the steel being shown for inspection and the knockouts and also when they pour these they pour them from the top obviously all the concrete comes falling down and then it pools that it would pool out so in order to inspect and tie everything together they cut a notch in the block to get everything tied in right then they cover it with plywood and then they'll pour so in the future video series you'll see that happening in real time which is really cool so you can see that's what you're looking at down here so other than the obvious these are 10 foot high block walls going from the slab all the way up and then the floor system is going to sit on top of these walls 24 inches and then it's going to have another 10 foot high frame wall up above so i'll try to document everything as we go through but this is the shell of the house which is really exciting to be at this phase so quickly we really did move pretty rapidly on this back here is going to be covered with stucco also talking about construction methods you'll see these these concrete beams here these are called precast lentils and they're created so it supports the weight of the concrete block wall up above and any load that's on it and it sits on each of these sectors that are poured solid with concrete on the sides of the windows and it acts as a support so anywhere you see an opening you're going to see a precast lentil the brand on these is called cast crete it's pretty standard fare at least here in florida of who they use to make all of them and they're not cheap so back here used to be the porch now it's all closed in this turns into a storage room slash pantry and then coming back here we have existing house so there it is from the back so hopefully i've piped in some footage as i'm talking here so you can see but remember at the end of the video i'm gonna just have like a little music clip and then a montage of everything happening because it wasn't always this tidy we were building out here it gets pretty pretty messy and pretty clean really quickly when you're doing concrete block walls so you'll notice these two notches here at the bottom on the existing house this was to locate the existing slab height so they could pour this concrete slab there's one over here there's also one up here i think they got it pretty good i'm a little concerned might be about three quarters of an inch out so this floor is probably going to be skim coated on the existing side but we'll cross that bridge when we get to it talking about window sills i went with the flush sills up here because the entire existing house has flush sills everywhere so we want to keep with that look so when we talk flush they don't stick out like a ledge these are flush and these are also precast and it caps off that block nicely this is a 12 foot wide by 8 foot high sliding glass door opening and again just similar to a garage door and any other opening that you're going to see in concrete block you have your pre precast lentils that go all the way across filled with steel and concrete and poured solid so it makes for a very tough structure i think jax is liking it so i'll pan around out here on the outside so we can get a good view of it and then i'm gonna pipe in some footage this is the remainder of the block that we didn't need and there's no room for a dumpster out here so this is my new garbage pile that contractor will scoop up and get out of here before we hopefully put in trusses which hopefully the delays won't be too long and we'll have trusses soon there she is this is the front of the house but all this fencing is going to go once this is not a construction site anymore this keeps all the the looky-loos out when we're trying to build some extra steel it's 5 8 rebar that they'll come and pick up so yeah i hope you guys are learning something on this video series i try to i'm green in some aspects of the construction process but i'll try to try to explain it to the best of my knowledge as we go so if you guys are thinking about starting a project like this you can be a little bit better educated and kind of understand the process as it goes so all right well this is it so right now i'm gonna pipe in all the footage of the hard work it's a three day three or four day project um one of the days was rain out but i'll put all that footage in so you can see all the fun and the not so fun stuff and how we got here so i really appreciate you guys watching remember to like subscribe and i'll get you on the next video next video is going to be actually i might throw in the next video pour into lentils just to get that up on the series because that is a phase but the next big one is going to be trusses so pretty excited about that guys alright talk to you later [Music] [Music] so [Music] so [Music] [Music] [Music] [Music] [Music] here [Music] so [Music] so [Music] so [Music] [Music] [Applause] [Music] so [Music] [Applause] [Music] [Music] [Music] [Music] [Music] [Applause] [Music] [Music] so [Music] good morning [Music] not a big deal but i don't want to turn into a big deal [Music] [Music] [Laughter] [Music] [Music] so [Music] uh [Music] [Music] [Applause] [Music] [Music] looks good come on [Music] [Applause] [Music] [Music] you"

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"VideoID": "1208",

"Title": "🏡 The Process of Building Your Dream Home: Step-by-Step Guide to New Construction! 🏗️✨",

"URL": "https://www.youtube.com/watch?v=QFEG0SkuRZU",

"Keyword": "Residential electrical construction",

"Transcript": "- Are you considering buying\na new construction home but don't know what\nthe process looks like? Hi, I'm Chris Porter, also\nknown as the Chris p Realtor. I'm a proud member of the\nSynergy United Real Estate Group. The Sure Group we're\nbrokered by EXP Realty. To start the new home building\nprocess, we would need to make sure we've selected your lot for your home site in which\nhome you'll be building there. Something to consider is\nthat if builders have applied for permits ahead of time, that would allow construction\nto start right away. If permits aren't in place\nyet, then that's a process that can take anywhere from\nabout a month to three months. Here are the six phases to building your new construction home. Phase one, the foundation\nconstruction begins with excavation where your\nhome's position is staked on the lot and prepped for the foundation\nfor homes with a basement or block wall construction,\nthe concrete footing, the base on which your\nhome's foundation will rest is poured. And when it's set, gravel\nis placed around the footing or under the basement\nslab for your drainage. - Phase two framing. Framing is the phase where things really start to take shape. Many homeowners think their\nhome is near completion at the end of this stage, but in reality, we are still\nonly about one third of the way through the construction process. So while the phases beyond this one may seem\nmuch slower in progress, it's because we are getting\ninto the fine details, which may not be apparent, but are vital to your finished home. - Phase three rough mechanics. Rough mechanics is the term\nused for the mechanical portions of the build, including\nheating, air conditioning, plumbing, and electrical. This construction phase is a\nswarm of activity as plumbing and indoor sewer pipes. Your furnace and ducts and\nelectrical wiring outlets and switches are installed. - Phase four drywall. The drywall phase of\nhome construction shows progress rather quickly. Rooms are separated and divided,\ngiving you visual effects of each space. Drywall is hung and finished and the ceilings are insulated outside. Bricks, stone, insiding are installed and your home site is graded for drainage. Prepare for the driveway,\npatios, walkways, and so on. - Phase five, interior finishes. The interior finishing phases probably one of the most exciting phases. You'll see many of the\nselections you made at your home design center come to life. This is when the builder installs kitchen and bathroom cabinetry,\ncountertops, mirrors, medicine cabinets, interior\ndoors, trimming stair rails, and many other detailed features. - Phase six final finishes. During this construction\nphase, kitchen appliances and flooring, vinyl, ceramic\nand hardwood are installed and both the interior and\nexterior of our home are painted. Later in this phase, you'll see carpeting in\nyour yard is finished, graded, seated, or sodded. Finishing touches are added\nsuch as cleaning the windows, floors, baths, kitchen, and so on. For more information on the new\nconstruction home processes, please give us a call\n'cause we are happy to help. My name is Todd Porter,\nalso known as Utah. Todd, I'm one of the founders of Synergy United Real Estate\nGroup, the shorter group. We are brokered by exp Realty. Now let's go make it a great\nhome buying and selling day."

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"VideoID": "1221",

"Title": "Industrial Electrical Contractors Atlanta GA",

"URL": "https://www.youtube.com/watch?v=PCcApX4znhs",

"Keyword": "Industrial electrical construction",

"Transcript": "[Music] if you're looking for a reliable professional and affordable electrician well you've come to the right place we're proud to be the top local electrician service and we're committed to creating satisfied customers no matter what type of electrical service or installation you need done we can do it all call our email one of our friendly staff now to set up an appointment [Music]"

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"VideoID": "1229",

"Title": "ABB is committed to the electrical construction industry",

"URL": "https://www.youtube.com/watch?v=3l02ztJYHKg",

"Keyword": "Industrial electrical construction",

"Transcript": "[Music] I want to thank thomas and betts and their up here this morning because they are they saw the importance of field leadership developing a strong leadership culture in any company is extremely important because I tell my guides all the time what happens when I'm gone who's taking over what happens when you're gone who's taken over our frontline supervisor is the key to the success of the job we can do all the pre-planning and all the work that we want up front but we don't have the right person when he or she is not equipped right on the jobsite we won't be successful one of my favorite quotes that I've ever heard about leadership was by simon Sinek and he said being a leader is not about being in charge it's about taking care of the people in your charge job site leadership would be for it is probably the most critical thing that our industry needs to master if the company's taken a significant interest in the leadership of the foreman and the Foreman's doing the same with the crew German wireman and the apprentice that teams that operated a much higher level it's my dream that as a manufacturer we could work with our contractor customers and partners to evolve together and that's product development to keep up with needs and that's people development to keep up with the changing nature of work I think it's phenomenal that thomas and betts made a positive gamble on providing training for considering the whole person seeing the importance of saying hey how do we make great leaders not only at work so that we can have them safe or more efficient but then also how do we just make their life overall better we're really trying to work with all phases of the project because that's where our products come in to help but we want to help the project get along and help our industry grow and to help have become even stronger these days it's harder to find the manpower that is needed to do this work thomas and betts is helping us develop this workforce foremen that have run our largest jobs are retiring and record number and we do not start to educate our young foremen our our young leaders right now we're gonna be stagnant we're gonna end up insignificant in this industry the old adage was to give our foremen a set of plans and say see at the end of the job we can't do that anymore we have to use that planning things like Building Information modelling digital scanning ground-penetrating radar items that we're using every day we need young leaders with the technical skills giving them room for growth and there's lots of avenues the process is so much information coming together and to build a job site to build a hospital build a data center and we need to advertise that to the group coming into the trade - to get them excited to make them realize how much of diversity there is in contributing to this industry and being a part of the electrical contracting trade we need to empower our frontline leaders so that they can do better and then as business leaders we need to learn from that process so that we can turn that back full cycle into future innovations and future improvements in the business so the question toss is in industry is are we creating an environment where leaders can explore new ideas if we don't change the culture of our industry we're never gonna have the willingness to experiment and and when we have a fear of failing we tend to stick with what we know we tend to stick with what's tried-and-true and that culture of hey just just get the job done don't ask will that really give us what we want as an industry well that that environment attract the leaders we need to attract [Music] your frontline leaders that get in there moment is coming their opportunity to run a big job their opportunity to be in front of a customer and impress that customer that's that get in their moment now the challenge is will they be prepared for that moment it's being able to reach out and put our arms around our customers and say we're in this together because the stronger the individuals are on the jobsite the more efficient you can be if you're using the right products if you have the right mindset and you have a good team now you're in a better chance to complete on time and be competitive and to continue to improve ultimately the image of the industry thomas and betts is a cutting-edge company their vision and focusing on the human development and the personal development of the people in the field is an investment that will absolutely pay off it's gonna pay off our contractors it's already starting to pay off and it's that type of cutting-edge visionary thinking that quite frankly this industry is going to need to move the needle forward [Music]"

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"VideoID": "1233",

"Title": "Do you like having a floor socket? #electrician #electrical #construction",

"URL": "https://www.youtube.com/watch?v=U2lMPZ8fqaU",

"Keyword": "Industrial electrical construction",

"Transcript": "what do you think about working within a framework with many rules always fearing making mistakes and lacking creativity in your work for instance I'm installing a socket base in the floor I'm using a cardboard mold to pour cement and fix the socket base many people might look at my way of working and think that this guy is sloppy and lacks professionalism but in the end I still manage to fix the socket base in the floor the rest of the job will be done by the tile workers who will lay the ceramic tiles on top do you like having a floor socket goodbye and don't forget to subscribe to the channel"

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"VideoID": "1244",

"Title": "INDUSTRIAL ELECTRICAL WIRE PULLING. #oddlysatisfying #electrician",

"URL": "https://www.youtube.com/watch?v=s3hiZZrkIhE",

"Keyword": "Industrial electrical construction",

"Transcript": "now this is kind of work I enjoy the heavy duty stuff horsecock Chinese fingers Chuckers oh yeah the big stuff oh yeah wire feeders that's when the company has money or a tractor to pull it that's good stuff right there that's the stuff I miss heavy industrial stuff"

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"VideoID": "1263",

"Title": "Kansas City Commercial-Industrial Electrical Contractor | CEI Electrical &amp; Mechanical",

"URL": "https://www.youtube.com/watch?v=r\_4MI9J1aWI",

"Keyword": "Industrial electrical construction",

"Transcript": "is your home or business in need of an electrical related repair or perhaps you need new electrical wires circuit breakers or even new lighting installed electrical work can be quite dangerous and it's really best left to the professionals we would love to help you we will assess your electrical needs quickly tell you the cost and get the job done right we take a great deal of pride in our work and would love to help you with your current electrical needs what their electrical needs are large or small you deserve an electrician who is professional polite experienced and punctual one that is committed towards saving you time and money and doing a great job contact us today you can reach us by following the directions on this page we look forward to hearing from you you"

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"VideoID": "1268",

"Title": "Tarey Modification Ferication Erection with 2 Cuts Bend Offset #electrical #construction#Mr.QURAISHI",

"URL": "https://www.youtube.com/watch?v=\_UozwsDFwDE",

"Keyword": "Industrial electrical construction",

"Transcript": "[Music] get ready to [Music] fight get ready to [Music] fight get ready to fight get ready to fight"

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"VideoID": "1277",

"Title": "Elliott Electric Supply Customer Testimonial: Performance Electrical Construction",

"URL": "https://www.youtube.com/watch?v=ddBzFGLTGrc",

"Keyword": "Industrial electrical construction",

"Transcript": "Nathan here with Devon works for performance electrical construction and uh just going to ask him a few questions about what he likes about Elliot Electric yeah I like the I like the um the fact that Hayden's always on the phone I mean it's just quick call away uh prices are always on on point you know always I'm getting good bits from Hayden and his team and um you know just all around just a great company um I'd say um they really do take care of you so if you need someone to take care of you definitely try them out for sure awesome well man what do you uh what what product out here are you probably most excited to see the new stuff about uh I would say lighting for sure you know with the new with the new lighting um Products that come in nowadays I mean you're always getting bigger and better and um you know especially you know Elliot's El Supply they're always bringing in the new top ofth the line stuff so um really I'm interested in the lighting and um but I mean as you know they have a lot more just lighting to offer so you know I really do like um everything about it so yeah well how long you've been doing business with us uh it's been about for me ever since I was 18 so um it's been about 11 years y know so yeah I started with my dad and um just stuck it stuck with it and uh here we are today so uh and uh Ellis has been on the ride the whole time so yeah man Deon we sure appreciate your time today enjoy the food enjoy the product Deon with performance electrical construction thank you sir"

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"VideoID": "1283",

"Title": "Electrical Construction Tutorial 1",

"URL": "https://www.youtube.com/watch?v=RL-0CzCf6HE",

"Keyword": "Industrial electrical construction",

"Transcript": "I guess are you a fresh graduate electrical engineer are you looking for a job in electrical construction industry in wigglies or are you a experienced the person in the construction industry and eager to learn different stages of electrical construction don't worry guys here I am starting in tutorial about Electrical Engineering in construction industry I am Ronnie work is I am an electrical engineer with 11 years experience in the construction industry why I am sharing my knowledge in the same industry to healthy fresh graduates to know about this industry because when I joined this industry 11 years before it is quite hard for me to learn things myself without the help of anybody please rather than this session are not only for the freshers but also for experienced people as I am this is the discussing all the stages of construction in my later session from the same to test engine Commission of the project I am starting with the basics of construction today we are discussing about type of building construction mainly following are the types of building first one is residential building second one is commercial building third one is industrial building fourth one is hotel and fifth one is hospital no he'll discuss about the resolution being asked the name indicating these buildings are used to for special purpose like me last presentation apartments awesome but we are staying normally in a glove or in an apartment so that is a residential building I just will see the videos following my videos for a better understanding about the residential building plan of a residential beloved let's go through the ground floor this consists of mainly dining room living room kitchen family room laundry maid so simple second part which is clear and indicate the drawing which is showing you no we will see the first this is magna carta stroke bedroom bathroom master sitting exit you nice to me I will not discuss about commercial building commercial buildings are the name indicates his commercial is for commercial purpose like Schwab's four pieces extra let us go go through this humble drawing which is relating the commercial buildings you think I'm proper if I conventional meaning these are consistent many shops in this building in addition to this when I bought the buildings not only for the convention with all the buildings there are going to be some service rooms like electrical rooms 10 406 routes going to be there anything about the name industry as a name indicating in the siblings are off our furnace no application like in factories stores candy I don't have any drawing but like this one so we will be sure the plan in the industry session but I am literally discussing about the individual project and deciding next one is a horrible horrible analysis for flesh wounds normally horton apartments consist of a guest bedroom living room kitchen and bathroom this is what is a horton apartment Horton apartment asana means it is like a apartment but it is a hotel with all facilities like a kitchen and they can cook or whatever they need to do that is the name is called as water apartment just let us go through a plan which is reflecting this is the brother of any hotel guest room this mainly consists of about just a single guest room with with one bathroom by touching with the detailed session of water groans I am it especially in the discussing the following section with the only type of size chambers and one officer normally what are those water system is what we are using normally this is all the same as all the things we'll be discussing the future section last one is a hospital building possibilities are mainly constipation suits acceleration rope examination room operation theatre etc as you know about the hospital there is a special requirement and they say in terms of designing very specific design is there for Hospital in me in my future section I'm designing section and clearly explain how is the hospital design at what are the system's you Sarah for this one through the plan of a hospital underlying this is a boolean said one patient room the patient suit I'm showing this is just one patient so to beat the marbled will be there and there will be entry passes and bathroom will be there and detail discussion will be we will be I will be posted in my future sessions guys thanks for watching my video please watch all my videos to know more about conception electrical construction industry if you industry please subscribe my channel or so to get the notification your screen thanks for watching bye bye"

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"VideoID": "1294",

"Title": "Electrician POV episode 10 #electrician #construction #funny #electrical",

"URL": "https://www.youtube.com/watch?v=LLZ\_BiqKirs",

"Keyword": "Industrial electrical construction",

"Transcript": "check it out if you want to know what not trying at all looks like this would be the one"

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"VideoID": "1296",

"Title": "Arc Flash and Electrical Safety: Safe Work Practices",

"URL": "https://www.youtube.com/watch?v=h3c-gCQ5ya4",

"Keyword": "Industrial electrical construction",

"Transcript": "safe work practices the difference between life and death safe work practices around electricity can mean the difference between life and death dangerous working conditions can turn deadly when employees try to take shortcuts or ignore the safety guidelines set forth by the applicable codes and standards consider the following scenario a foreman who was an employee of an electrical contracting company was called in to install circuit breakers in the main distribution panel at a commercial construction site electrical power from the local power company was connected to the commercial building's main distribution panel via feeder lines the foreman decided to install the circuit breakers without shutting down the power as this would require a two to three days advance notice to the electrical utility moreover the incoming tenants in the office building did not want to shut down their computer servers the foreman regarded installing the circuit breakers to be a relatively simple process that could be accomplished safely by relying on personal protective equipment only two other foreman who were not wearing any personal protective equipment stood about 10 feet from the distribution panel that is outside the arc flash boundary for that piece of equipment the victim reportedly wore leather gloves over rubber insulating gloves arc flash headgear with a face shield and an arc flash jacket the foreman uneventfully installed the first circuit breaker as the foreman moved to the second circuit breaker he accidentally made contact with two phases of energized circuitry with a screwdriver at the three-phase distribution panel this resulted in a blinding arc flash followed by an explosion the foreman was thrown backwards from the distribution panel due to the force of the explosion he suffered first and second-degree burns on his arms legs and back the other two foreman who were standing outside the arc flash boundary apparently suffered no injuries osha investigation into the incident concluded that the arc flash and subsequent injury could have been prevented by adhering to basic electrical safety principles first and most importantly the main distribution panel should have been placed in an electrically safe condition prior to the installation of circuit breakers the apparent justifications for failing to de-energize electrical equipment in this incident which focused solely on the inconvenience of shutting power off does not meet the necessary conditions for working on or near energized electrical components under the nfpa 70e moreover the victim who was designated by the contractor as a qualified person was neither adequately trained nor qualified to work on energized electrical components the foreman's lack of training and understanding of electrical safety principles was evident from his belief that he could safely install circuit breaker boxes on the main distribution panel without de-energizing it and that personal protective equipment would be enough to shield him from electric shock or arc flash while the protective equipment and clothing did protect the foreman to some extent he still suffered serious burns on a large portion of his body according to the hierarchy of controls personal protective equipment must not be used as a first line of defense against electrical hazards instead de-energization of energy sources is the preferred approach and personal protective equipment may be used as a last resort or may serve to provide additional protection it is important to note that the two other foremen who adhered to the electrical safety related work practices and maintained an adequate distance from the distribution panel came out unscathed from the incident this example demonstrates that violations of the basic electrical safety requirements as set forth by osha and the nfpa can result in devastating consequences employees supervisors and managers must be adequately trained to increase their awareness and understanding of electrical hazards in their workplaces and the safe work practices for working around electricity"

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"VideoID": "1318",

"Title": "I bought a container full of Chinese electric construction equipment!",

"URL": "https://www.youtube.com/watch?v=WLOQhEmmYw8",

"Keyword": "Industrial electrical construction",

"Transcript": "hey everyone mik here with ebikeschool.com and I've done it again just bigger this time this is my container full of electric construction equipment I just brought it in from China it was quite an ordeal spoiler alert it involved a lot of trucks and cranes and some serious operations but first just like me I'm sure you guys want to see what's inside so let's get to opening this thing up there we go all right here it comes yeah one of my loaders is definitely a skew what you're looking at are the backsides of two of the four different machines in here the front tire is all the way up in the air it looks like the container got bounced around a decent amount in shipping and one of the machines wound up slightly up on the wall partly held there by the steel cables they used to try and keep everything from shifting around in transit eventually once I climbed in I was able to wiggle the steering a bit and help lower that that wheel down then after removing the steel cables and the wheel chalks in the floor I got to gingerly slip the first loader out there's like a/ inch of clearance between them there so I tried to go slow and not scratch my new ride before it was even out of the box with the first machine out the second one was much easier to roll back and without the need for a spotter my dad could lend a hand as a cameraman too even if he goes uncredited at the end and once the first machines were out it was time to play around it's amazing how quiet they are you can see my dad taking it on the first ride and it is much quieter than my family's dog barking from much further off in the distance you basically can't hear the loaders at all from a distance and then when you're right next to the machine you just hear like a soft wor from the hydraulic motor since they're electric there's obviously no combustion engine or exhaust noise there were still two bigger machines in the back of the container but we were having some fun playing around digging up some dirt and seeing what the machine could do in the first few minutes with it and quickly we started to run out of light so we had to close up the container and then start again tomorrow morning what I didn't show was this entire process actually took hours and hours not just the rigging and delivery of the container but also UNCA and knocking out all of those wheel chocks that were nailed down into the floor the whole thing was just quite a mess good thing you didn't need a big breakfast all right so ran out of light last night time to get the attachments and the next two loaders out here all right so yeah it looks like I've got my two Digger attachments the augur and some uh forks for the forklift here that I got to get out first before I can get these next loaders out what is this oh my gosh how did I not notice this yesterday oh that is awesome looks like this is a gift from the factory this awesome little wirework dragon thing here all right where to start to get the next two machines out I had to get the pallet forks and the other attachments out of the way but they're nailed to the floor using chalk blocks just like we had under the loader tires so those had to be banged out first and there were a lot of them oh man these are heavy Jesus next came the Digger attachments which I'm super excited about testing out they should basically turn a front loader into an excavator meaning you have the equivalent of two machines in one almost like your own little electric backhoe I also got an augur to test out too and fortunately it doesn't weigh quite as much as the excavator attachments but each of these has to be a couple hundred lbs easily if not more I was able to drag them out of the way enough to make room to take out that next loader which is a larger model weighing around 42,000 lb or just over 2 metric tons [Music] and then finally came the last of the four loaders now that all the loaders were out of the container we wanted to start playing with them and learning the features I made sure to spec quick hitches on these so that I could swap out the attachments easily without getting out of the cab and I have to say that this is a really nice feature with one hydraulic lever you can drop your bucket and then pick back up again or put on another attachment which to me is just a really cool and useful feature when you have several other attachments like diggers augers grapples snowplows or anything [Music] else [Music] okay got all the loaders out now I've got these uh various attachments got the augur here a few Digger attachments and the pallet Forks once I got the pallet Fork on I went to grab a pallet to rest the attachments on this is my first time ever using a front loader so you'll have to excuse me if I wasn't as efficient as possible but I was pretty proud of myself that I was able to grab that pallet from behind the compost bins lay it down flat on the forks wiggle it free of the barbed wire fence and then plop it down just where I wanted it obviously I could have carried it over by hand but now that I have four wheel loaders I don't need to lift things anymore all right I'm going to try and pick up this Digger attachment with the forks got some straps here see if I can get this rigged up all right let's see what happens when I lift that so there's one Digger attachment with two more heavy attachments to go I went back to the container for more the pallet Forks combined with the lifting straps prove to be a great way to lift and move weird shaped items like these that are too heavy to pick up myself and also too bulky to team carry with someone else for more than a few [Music] feet when it came time for moving the sets of pallet forks I didn't even need straps to lift them since I could just pick them up with the quick hitch and wear them over to the drop point where I'd release them from the boom easy peasy lemon [Music] squeezy [Music] so so far the loaders are working great and they're just just so versatile that's the cool thing about a loader you know putting those pallet Forks on them made it easy for moving stuff around but of course one of the main jobs for a loader is actually loading stuff using these big buckets to pick up dirt and other loose material so that's what I want to try next we've got the buckets back on here and I want to take these suckers over and try moving some dirt around and seeing what that's [Music] like [Music] [Music] h [Music] [Music] a [Music] [Music] and of course I'm not going to miss a chance to try loading up my mini truck the one of these [Music] things [Music] so the pallet Forks are super useful the buckets obviously work great for loose material like mulch compost sand and such but next I wanted to test out the Digger attachments I got to see if these electric loaders could substitute as kind of a poor man's mini excavator the Digger has its own Hydraulics that you connect into the loaders lines and they're powered by the same auxiliary hydraulic switch as the quick hitch so once you've got the quick hitch engaged and the Digger attachment on you throw a lever that reroutes the Hydraulics from the quick hitch into the Digger's bucket instead it's a really cool idea but I was a bit worried that this would be like some products that attempt to be a hybrid of two different machines and end up not being great at either this was obviously my first time running an excavator attachment on a front loader and only about my second or third day on a loader at all so it took a bit of learning here the basic operation is you lower the boom of the loader and then tilt what would have been the loader's bucket down until your Digger buckets teeth are in the ground then you throw the quick hitch hydraulic control to curl the Digger's bucket I went slow at first since I was still figuring out how it would operate and getting to know the machine's unique quirks [Music] that's actually working pretty well I mean I don't think there was a big difference I mean basically you still have boom and stick right yeah I mean the mechanics are [Music] identical after just a few buckets I felt like I was getting it pretty fast and and then it was my dad's turn to bang out a little more of the growing hole we were digging now you are a bit limited compared to bigger excavators since the shorter reach only gives you about 3 and 1/2 or 4 ft of digging depth but that's enough for a lot of uses like planting trees digging trenches and other around the property [Music] tasks all right I don't know about you guys but I think I'm going to call this Digger attachment a pretty awesome piece of kit it worked so much better than I was expecting honestly I I really thought it was just going to be kind of like you know a toy Fisher Price my first Digger kind of thing I didn't think it actually work this well but with just 10 minutes of playing around here I've gotten a good size hole and it's pretty easy to control if I had a hobby Farm kind of like my parents here then I could see this as a really important tool and that way you don't need both an excavator and a loader you just have a loader and throw your Digger attachment on the front [Music] next up it was augur time the augur attachment mounts just like all the others with the quick hitch making it easy to pick it up and secure it without ever needing to get out and even touch it yourself though you still have to make the hydraulic connections by hand and then you throw that lever that connects the hydraulic lines to the quick hitch lever to use the augur you basically just tilt what would have been the loader's bucket all the way down so the augur hangs freely then you throw the quick hitch lever to turn the augur on and start lowering the boom letting the augur do the [Music] work this is an 8 in augur so the hole it makes is a bit wider than we needed for this fence post that my dad conveniently had laying around but you get the idea that work pretty well though well worked perfectly I mean you had to get a feeling for if you have to put up 100 fence posts this is going to be a much easier way to do it than hand digging or even using a power [Music] [Applause] dogger all right so I've been playing around on the loaders for a few days now and it's about time I gave you guys a walk around and check out what makes of these tick now they're actually quite similar like I mentioned I got three of the smaller ones and one of the larger ones that was all that would fit in that 20 foot container I figured that probably the smaller ones would be more of like a hobbyist machine you know and it wouldn't be as capable that's why I wanted to make sure to get one of the bigger ones but I will tell you with playing around with these these smaller ones are incredibly capable now the bigger one here it has got a ton of power in my opinion perhaps more power than I really need you know both of these are are certainly sufficient for most people especially in like a a small ranch type application like what my parents have here I mean with this bucket here it was no issue lifting up just entire bucket loads of mulch when it comes to lifting with the forks we had some big things on here of course with the bigger model here you've got a lot more power again like you're not going to need that much power when you're just shoveling mold shoveling dirt shoveling anything but when you've got the forks on there and you're trying to lift real heavy things that's where that extra power is really going to come into play but I'm incredibly impressed with just how versatile and just how capable the smaller one is here let's give you a walk around here though and see how these machines work so they're both articulating loaders that means that they have this articulating joint in the center that's what makes them so Nimble super easy to just wiggle around with them and they're a lot more Nimble than like a front loading tractor or something like that that only has front wheel steering the fact that these things articulate that they Bend in the middle makes it so easy to just go in such a tight little turning radius and you can really wiggle around in much tighter places than you would with with a tractor or something like that little dizzy in terms of the controls here everything is basically handled by this right joystick lift it backwards like this that lifts the boom up forwards that brings the boom back down to the left curls that bucket or whatever attachment you have to the right dumps the bucket or any attachment down here you've got your accessory hydraulic system so this is generally hooked up to that quick hitch that I demonstrated earlier but I've got this nice valve up here that I can throw and when you put it in the other position that allows you to use all sorts of other attachments so you know like we had that uh Digger attachment on the back that was super convenient to use the augur basically anything that has a secondary function like that a 4 in-one bucket something like a barrel Grabber or some type of grapple that sort of thing all of that's controlled right here with this accessory handle up here on the console of course we've got our key for ignition uh we've got our lights I haven't really used these at all we've been doing everything during the day obviously I don't need the blinkers or anything but they're there if you need something like that you do have your uh top light and also your hazards again if you're in like you know a work area construction area something like that you want to be extra visible the steering wheel here it's got this nice ball on it which makes it super easy to steer because most of the time you're going one-handed right you got one hand on that joystick controlling the functions the other hand on that knob making it really easy to steer there is no engine here but there are two electric motors I've got one on the front axle there got a second on the rear axle here that gives it its four-wheel drive there's a little differential on both of them and then there's actually a third electric motor and that's what's running the hydraulics in here so three motors total and that separates the drive and the hydraulic motors so you don't need such massive motors for each in general I will say the construction of this thing is really quite impressive I mean the thing is sturdy I was a little worried about this canopy but like I mean this is a roll cage this thing is solid it's got grade eight Hardware all the way around if you come around the back here we've got a tow hitch in back which is nice you've got that 2-in ball if you're going to be towing a trailer or something I don't know how many people actually tow to with a loader but it is nice to have that option now over here on the bigger loader everything is basically the same you know you've got your same multi-function joystick here the same accessory Hydraulics here one thing that is probably the biggest difference besides the extra power in this machine is that it actually has functioning doors so there's a door latch right here and you've got doors it's a little more of a climb up there's a nice little step here though I generally just step on the tire it's kind of easier um but it is nice having those doors because the other one you kind of got to wiggle through the fixed guards there the bigger loader here also has a nicer hydraulic fluid sight gauge on the side it's a sort of combination between a fluid level and a thermometer for the fluids you can see what the temperature's at now the construction on both of these is really quite impressive I mean we've got serious thick steel plates here little bit thicker on the bigger loader to be expected but you know these are heavy machines this one's about 2200 lb the bigger one's over 4,500 lb so you know not lightweight these are well constructed heavyduty machines same thing with the buckets I mean these things are massive they are heavy they are well constructed if you look at the welds on everything the welds are actually really nice many places they're even smoothed out this is not something that was just tacked together this is not a you know cheap fall apart kind of thing if you remember when I unboxed my truck a few years ago a lot of people were talking about the frame welds how they weren't really good I mean the truck was held up great but yeah I'll admit that the frame welds were kind of sloppy here there is no sloppy welding this is really well constructed and I'm very happy there to see that kind of quality in the construction [Music] all right now I'm sure there are a lot of people that are wondering why electric you know there are so many diesel loaders out there why go with an electric one and well there are several reasons we're going to put the environmental things aside for a minute because you know a lot of people when they're dealing with work machines like this that's not their first concern though it's not unimportant but if you even forget about those for a second just the quality of life improvements here are pretty impressive for one it's nicer and more convenient to use my dad and I were using them and we can still carry on a conversation we're not shouting over the sound of an engine there's no exhaust that you're breathing in that awful smell and you know it's carcinogenic it's not giving you or your family cancer while you're driving around using it on your property or around your home next if you're talking about cost think about fuel savings you plug this thing into the wall it costs I don't know a dollar to charge it up then there's the maintenance there's just so much less maintenance to do here yeah you got to check your hydraulic fluid change that hydraulic filter every now and again but on the actual electric side there's there's basically no maintenance it's not like a gas or diesel engine even sure one day the batteries are going to need to be replaced but when that happens it's something you can do at home by yourself you don't have to take it to a mechanic or to a shop to work on it changing the batteries are only slightly more complicated than changing the batteries using your remote you know it's the same idea they're just a bit heavier to lift out that's how simple this thing is to work on it's just a few electric motors some batteries and a controller so many fewer parts to go wrong and in my opinion it's just a nicer cleaner more convenient machine to work with and if you're the kind of person who doesn't like doing maintenance all the time or taking your machine somewhere to get fixed by a mechanic then electric is just going to work better for you [Music] all right now let's talk about why I bought four of these loaders originally I just wanted one loader you know I wanted one loader from my parents property here I thought it'd be useful thing is I couldn't just buy one the factory in China where I got it they said that their minimum order was a container full of these this case that meant four loaders I got the smallest container I could a 20t a container and so I got three of the small ones one big one partly because the big one was really expensive compared to the smaller ones that way I could compare all of them figure out you know if I wanted a bigger one or a smaller one I could sell the rest you know I figured I'd take three loaders and find them a happy home somewhere else in the US someone would be really happy with these or three someone's but as I went through this process I got a feeling for just how hard this really is to get these things from China you guys have seen me buy other things you know my electric mini truck my electric boat those kinds of things and you've seen if you've watched those videos just what a convoluted long and expensive process this is you know with my electric mini truck that was advertised as a $2,000 truck on Alibaba by the time I got it here it was $8,000 out of pocket so these things are not cheap I mean that container back there that's almost $50,000 worth of loaders and attachments sitting in that container which by the way I got to give a shout out to my wife for letting me put that much of a risk into this but the only reason I could do that was because I decided this wasn't just going to be about getting a loader or even four loaders that because this process is so difficult for people to get what I think are such useful machines I wanted to create a service that would provide these kinds of awesome machines here in the US where you simply cannot get them that's why I am excited to tell you that I starting nesare this is a company that I think is going to serve a serious need here in the US to provide small right-sized highquality electric construction equipment Earth moving equipment and those types of Machinery that we simply can't get you guys have seen just how useful these things are I wanted to start with these loaders because of how versatile they are like we saw I mean you could lift big logs the water containers the Digger attachment the augur the forks I mean moving Mulch and dirt there's just so many things you could do with these there's so many Hobby Farms farmsteads all sorts of things co-ops that could use these types of machines but they're just unavailable in the US and they're so hard to get from overseas these are also normally super expensive types of machines a Chinese made diesel loader of similar size to mine starts at 30,000 bucks in the US you can barely find electric ones here in Europe a smaller electric one starts at a similar 30,000 bucks meaning in the US it'd probably be well over $40,000 so I want to offer machines that you just can't get here in the US and for well under half of what they would cost elsewhere so I started with these four these probably aren't going to be the final product like you guys have seen what I do is I bring interesting machines in from China I then figure out what needs to be done to them to improve them to sort of americanize them and I work with the factory to make these types of things even better so of these four loaders I'll probably be selling three of them if you're interested in picking one up you can uh head over to NES show you can already probably find them up there but if you're watching this video more than a couple weeks after it came out then I will likely have the full sort of finished products up there because in the future that's what I want to be able to do is to provide these highquality right-sized electric machines in the US but not just that but to provide a company that can really give service and support cuz yeah you can go and find these kinds of things in China the problem is like I've discovered not only is it super expensive to import one or even a few of these but there's no after Sal support you know you are on your own a few days after they have their money they don't care about you anymore I even bought an electric excavator a while ago I filmed this whole unboxing at some point I'll probably edit this video it's it's a bit embarrassing though so I haven't shared it yet because I basically got scammed unfortunately this thing showed up it was not at all what I ordered it didn't work I never got the thing working and the company at first said yeah yeah we're going to take care of it and then they stopped answering my messages now I can't contact them I basically got screwed out of some serious money like I said at some point I'll probably edit that video because I think it is a good learning experience for people to learn from unfortunately my mistakes in that sense but that sort of brings me back to this whole idea is that it is so difficult even for someone like me who was imported so much stuff from China that you you never know when you're going to get screwed and when you're going to be out a ton of money not to mention things just showing up broken or or whatever so that's the whole goal here is to create a service that can provide these things here in the US local sales and support and to give you a machine that you know you can trust that's why I'm starting nesare and I'm really excited for this because I think it's going to serve a need that is so sorely underserved right [Music] now all right that's all I got for you guys today I hope you enjoyed that video it was a long time in the making many many months a lot of expense so much more than I expect in the beginning all of those charges add up along the way it was a lot of faith put into this but I think it paid off because I am just so happy with how well these loaders are working and I am super excited to be launching NES a because I think this is going to be a really important service that brings these desperately needed machines to the US and puts them in the hands of people who can really make use of them before I go though it is now time to start the ebikes for good giveaway if this is your first time seeing one of my videos first off welcome but you should know that at the end of every one of my videos I give away a free ebike by partnering with a number of ebike companies to someone who is in need someone who an ebike would really help improve their situation in life but they just can't afford one so if that sounds like you I want you to go to my site ebikeschool.com the URL is down below and enter the entry form there let me know what is your situation how can an ebike really improve your life maybe you needed to get to work to get back into exercise to go visit your kids anything let me know why it would be useful to you but you can't afford it there will be a random drawing among the deserving entries and it will be announced at the end of my next video the bike that I'm giving away this week is the angu M20 this is an awesome moped style bike it's got these 20-in diameter 4in fat tires which is my favorite size because it makes it really Nimble but you still get those nice fat tires it's got got that powerful rear motor gets up to 20 mph on throttle or even faster on pedal assist and it is just a super fun bike for riding around whether you needed to go to the store get to work do whatever you do with an ebike I think this is going to be an awesome one I've had a ton of fun riding this thing and I know that you would enjoy it too so if it sounds like something that you could use but you just can't afford one of these head on over ebikeschool.com ebikes for good fill out the entry form and I hope that we can get you a free ebike now though it is time to announce the wi of the bike giveaway from my last video and the randomly selected entrant is Elena R so congratulations I just spoke on the phone with them I'm really glad to be getting this ebike out and for you hopefully you will be the winner of that angu M20 at the end of my next video so make sure you enter the form there and it might be you now the real last but not least it's time to announce the winner of the book giveaway for my last video and the randomly selected commenter who will be winning a free copy of one of my books is K4 rjj so congratulations just let me know which one of my books you'd like you can choose from DIY lithium batteries DIY solar power the ultimate doyour yourself ebike guide or my latest book the electric bike Manifesto and anybody else who wants a chance to win one of my books for free all you got to do is put a comment down below you can say anything you'd like and hopefully you'll be the randomly selected comment dur at the end of my next video if you don't want to wait that long to hopefully win a free copy one of my books you can always find them on Amazon all right thanks for watching Everybody I'll see you here next time look at me sometimes like all you want to do is run hear me out hear me [Music] out it's all the things you show"

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"VideoID": "1339",

"Title": "Boost Efficiency in Electrical Construction | Mike Evans on AECInspire’s Impact",

"URL": "https://www.youtube.com/watch?v=lHpsgmutp7s",

"Keyword": "Industrial electrical construction",

"Transcript": "[Music] my name is Mike Evans I'm the Executive Vice President of U Holdings and the vice president of United Electric here in Cincinnati Ohio United is a medium-sized contractor we specialize in heavy uh heavy commercial institutional heavy industrial um very strong in the automotive manufacturing petrochemical uh chemical plants we're we're quite a diverse company so mik from the GM perspective well how's the AC Inspire experience kind of changed the way you you think about the the operations it's been very en enlightening uh from everything from the beginning taking the job off to the design to the installation uh the time has been reduced overall uh the efficiency levels are through the roof there's a tremendous savings there's hardly any waste at all uh again all equ equates to Dollars and cents uh putting a better product in how has the team adapted and adopted the the new workflows and the changes I can tell you firsthand that the team has fully embraced it in the very beginning there was some a little bit of skepticism I guess again since we've started utilizing the program and software working with your team um again they've totally embraced it and they see the value and that's where the industry is going and where we as a organization need to be going how does this effort compare to the prior prefab efforts here at this shop uh it's day and night uh from our experience even from the methods of doing the prefab from the calculations uh to the installation methods there's a huge change uh just from the assembly makeups um the software programs have been able to to help illustrate some of again it's all about efficiencies and it's just improved our processes tremendously so awesome what El the first project that you did with AC Inspire yes we started pretty small corre right and you know what was your expectations for labor savings and kind of what have you seen through the first project um the expectation I guess we were looking for a 10 to 15% expectation but again it's been tried and proven that we are anywhere from 20 to 30% efficiency increase uh again our efficiencies go up our cost keep going down um we have other crafts on the tra or on the project that are coming to us and asking us to slow down uh and I'll be honest with you currently we're running about three weeks ahead of schedule uh even with a late start so we are pushing now we are taking control of the project we are pushing the Carpenters the framers we feel very good we control the projects now there's less anxiety less stress now we're not worrying about being covered up by the other crafts in the next project and future projects you know how quickly do you expect to scale up and do more prefab like kind of what's your thoughts on the future we're myself and my team I don't want to speak for them but we are True Believers we have full intentions of maximizing our capacity and going is it it's just going to open up way more doors for us uh and it's going to make it easier to operate we can allocate resources uh better utilization of resources and it creates more opportunities to chase more work does the methodology and the experience here change the way I mean do you think you're going to be able to win more work I mean by doing this a new approach absolutely and just because of the savings and what we've experienced on the first project knowing those efficiencies we can apply those to Future projects which will again reduce our overall cost and what we feel is risk and we can be more competitive and and I'm sure we'll be be awarded more projects [Music]"

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"VideoID": "1353",

"Title": "FLEXIBILITY BUILT-IN - Industrial electrical installations with Lewden Palazzoli TOPTER",

"URL": "https://www.youtube.com/watch?v=dmIV-YGjuqw",

"Keyword": "Industrial electrical construction",

"Transcript": "- [Gordon] We're here on site today in this industrial unit and we're looking at some of the challenges you have with industrial wiring. Now, the very nature of industrial units themselves causes those challenges. Because tenants change. One day it might be someone doing some carvaliting might be someone doing a bit of joinery the day after or even an electrician moves in. And each tenant needs different electrical systems. They have different equipment, machinery's change, business grows and tenants change. So what have we got installed at the moment, Gary that's been inherited in this unit? - [Gary] Not a lot, we've got a twin 13 amp socket outlet here. A 3 phase one, and a 16 amp single phase socket outlet on this area here. - [Gordon] All right,\nwell that one seems to be - [Both] Upside down. (laughing) - Yeah now, when you add something to the wall there in terms of new sockets particularly things like 3 phase, you have to do something here at the distribution end. So let's just have a look in the cupboard, Gary. Let's see what we've inherited. Oh, oh dear, okay. Well we haven't got a lot to work with in this industrial unit so clearly some changes are going to be needed. Perhaps, perhaps it might just be best to have a full re-wire of the full unit. And that give us a chance to use a product that we've looked on the channel before, Gary. Now what is that product? - It's the top tier range\nfrom Lewden Palazzoli we've seen it on the channel many times and Joe absolutely loves it. I think he calls it the lego of the electrical industry. Because of the amount of variance you can have. And I've been busy creating one already. - Well I've created one as well, Gary. Go get yours, I'll get mine. What have you got? - Well what I built what we have here. I've got a industrial 3 phase socket outlet 16 amp one and believe it or not, under here I just put a 13 amp one in as well. - Well all right, that's okay. I've just gone straight for some 16 amp but I've put an emergency stop and some light switches on it. So, this is the flexibility of the system. I think we best go back to the workshop and have a bit of a deep dive into what we've done here, Gary. Just to look at some\nof those other options and how it can be used to solve problems we have in industrial units. Not just today, for the current tenant but for the next tenant that comes along so we can make quick changes. - So, Gary, you managed\nto get to the lego box before I did. What have you managed to conjure up for your solution? - [Gary] Okay, let's break in and have a look. So we've got a 3 phase 32 amp socket. We've got a 16 amp one and our traditional 13 amp, 3 pin one. And these two here both have interlocking switches. - [Gordon] All right, so I can't energize this socket unless the plug's properly inserted. I can't, I can't turn that switch. Interesting, I like B rating, so the system itself is the enclosure is IP 66 but you've chosen and IP 44 socket. So, that's yeah, obviously that's a choice you have with this system depends on what what you need to get in the area working. Let's have a look at this circuit protection. That's my favorite mechanism here. - [Gary] Yeah, I knew you were in there quickly, yeah so there's a mechanism, which can be locked off as well. So, it's very easy to open this up. And we've gone with an incoming RCD protecting all the circuits in here. Obviously have a 3 phase 32 amp breaker and a couple of 16 amp ones as well but look how much room I've got if I want to develop it on further. - [Gordon] Yeah, that's an interesting option there. Because obviously now more and more socket outlets require RCD protection - Absolutely, yeah. - [Gordon] And that causes you a big problem with your distribution board because that, you know, having to put an RCD in there plus the over current device. That takes up a lot of space. - Yeah, and of course, doing it this way means that we just have the single breaker coming out and the RCD protection for more than one circuit is incorporated in the top tier. And we think that's a brilliant solution, don't we? - Yeah, because obviously it allows to, yeah, got the RCD protection but then you can configure your over current protection to suit what's installed here. Yeah, so that's gonna throw up some interesting installation. So you might feed this here with a 63 amp incoming supply from your distribution board. - Absolutely, yeah. - Yeah and then you're breaking it down for the individual sockets. Now, here's an option we could do. We have featured before in the past. This flat cable system. - Well you're throwing that one in. You believe that we could perhaps run this around an industrial unit tap -ff box, maybe a flexible conduit or maybe a tough sheath or hi-tuff - Tough sheath. - Tough sheath cable down to the actual enclosure itself. - Yeah, could be another option there. So again that's just a different way of thinking about industrial wiring. - Right, okay, well I had a main RCD switch in mine. It looks like you've got a slightly different configuration. Take a look at yours? - Yeah, I've done things\nslightly differently. Now, when it comes to the top tier range there's two enclosure styles. You've got this one that sort of takes joule modules and traditionally you've needed that for the interlock sockets. - [Gary] Okay, yup - [Gordon] But I've used another clever product from the Lewden Range, Gary, and it's the XCE range but with a rotor switch so let's just have a re-cap on how that works. - [Gordon] That's what I like about the Lewden Range is the interchangeability between different system components and it carries on with the XCE range. I've got a plug and\nI've got a socket here. Now, if I want my socket to be a sort of, free one on the end of a flexible cable I just attach this rear housing to it and I've got my cord grip and everything else nice and robust. And also, so this is a standard socket here that doesn't have a switch mechanism. But here's our one with the rotor switch in there which means I've got an interlocking switch operation to it. So again, I could put that with a flexible cable on there or here's the clever bit, I can mount it to to the front of our top tier range by putting it into this adapter here. So again, it's very simple. That just screws in and again there's a\nlocking mechanism there. So that's rotor link if I wanted the interlock version and I can go also with the non-interlock version as well. Now that's pretty clever and quite unique to this system. - And for even further information on the XCE range it's worth checking out the video that Joe made. I'm sure you'll leave a link in the description below won't ya? - Yeah I did and that showed some of the important safety benefits of interlocking switches and sockets Now, so that was the socket outlet. So because I've used that, Gary I've managed to save a bit of space. - Okay, so what have you, let's have a look, let's see what else you've put in there for us then. - [Gordon] Might worth saving that but I managed to put in an emergency stop in there and again what you're doing in the area I've even managed to put in some light switches as well so if you want perhaps you needed some local task illumination in the area, that could be wired from this panel as well. I look at my circuit protection, I've gone down a different route. It's a main switch isolating all of the socket outlets here and then some individual RCB option. And again, still plenty of room because the XCE range also is available in 3 phase as well. So I could've had, obviously, I could have had more single phase outlets and a 3 phase one if I wanted to as well. - It's clear, isn't it? The choices are almost endless. Look at the table, look at the stuff we've got behind us. I think it's your imagination that's the only thing holding you back. - And it doesn't stop there as well, so obviously if you still wanted to do things, shall we say, the old way with all your circuit protection from the distribution board or perhaps you wanted to wire in some additional socket outlets from your board here. You can obviously get the top tier range with these wall boxes as well. So again, if I wanted to make this an interlocked version,\nI take this one out and I bring in the rotor link. Yeah so just, again, put that in there and then I've got a plug-in version. So let's just check how that rotor link works again as well. So I bring the socket outlet in, it fully engages a twist on to get my IP rating (click) So there's the rotor link, the name gives it away, we always like that. (click) And there we go, I've made the can hear that good positive action and that'll support any C23A switch, that we see in the those previous videos. - I didn't see that video yet, so we'll link in a\ndescription to that one. It, yeah, I'm just thinking why haven't we thought of this before? We were in a different industrial unit and it was clear, wasn't it? That one of these screwed to the wall and the flexibility it give you both for the current user and future user is immense. - And we've seen how regulations keep changing, more RCD protection. Now, we've got some\nother ones as well, Gary behind us. You may, if you've seen\nthis product before, and people got pretty excited about it. We made this version here for use possibly as a building\nsite temporary supply. Well actually, we didn't make it. We, Lewden, we drew a famous sketch and they came back with this fantastic option for a temporary supplies on construction sites. But yeah, there's just a lot of different options out there so. We're not, in this video, going to look at the internals of this because we already have\nthat fantastic video that shows, obviously, some of the other options with a top tier range and bags of wiring room in there. - Yeah, and again, I'm sure you'll leave the link description. There's another video that Joe produced. But, as always, we're interested in your thoughts. Now, would it be wise for us to follow this on with a video where perhaps in the industrial unit we saw at the start we actually install these as a solution to the\nlack of socket outlets in that area. We'd like that feedback. Are you currently using any of the range in this top tier from Lewden Palozzoli at the moment? Is there any top tips you want to give our community? Please leave those comments below and me and Gordon will also try and get back to as many as we can."

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"VideoID": "1356",

"Title": "Alumni Spotlight: Apryl Raggs - Electrical Construction and Maintenance",

"URL": "https://www.youtube.com/watch?v=2o5\_holkiP4",

"Keyword": "Industrial electrical construction",

"Transcript": "My name is\nApril Raggs and the program I graduated from was Electrical\nConstruction and Maintenance [music] I chose Coyne College because\nit was close and I heard only good things about it,\nso I figured I should come. The thing I liked most\nabout it was mainly the teachers and how\ngood they were able with explaining stuff\nand helping you out and making sure that\nyou figure things out. They were just really helpful\nthroughout the whole thing. Some classes where you just sit\nin class and you just do math, where you have classes where you're\nactually doing hands-on stuff like the little boards and doing\nwires with lights and stuff or a big lab where you do actual\nconstruction work and you bend pipes. My short term goals are\nto get my associate's degree in electrical\nconstruction and maintenance and my long\nterm goals are to just have a good career in\ndoing electrical work. I'll give a student\nadvice, I would tell them to make sure that they\nstudy and just pay attention in class because\nas long as you study and pay attention,\nthen you always be good. [music]"

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"VideoID": "1395",

"Title": "#iti electrician #electrical work #field of electricity",

"URL": "https://www.youtube.com/watch?v=QnTkXQGjTBc",

"Keyword": "Industrial electrical construction",

"Transcript": "[Music] this is [Music] [Music]"

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"VideoID": "1434",

"Title": "Industry Insight: Careers in Construction (Electrician)",

"URL": "https://www.youtube.com/watch?v=PoTas57SWyc",

"Keyword": "Industrial electrical construction",

"Transcript": "It can be quite repetitive if your first fixing\non a big job or things like that. It's a big construction site where you've got a lot of\none thing to do, it can be quite repetitive. But every day does throw it's challenges at\nyou. I'm doing inspection testing as well as insulation\nso it is quite varied and unique. I think working on a building site with my\ndad from a young age and seeing the electricians and didn't really know what was going on.\nI was always curious about being an electrician. I suppose it was my father, I worked with\nhim when he was an electrician many years ago. I worked with him, helping him out on\njobs. No I don't think anyone did, it was my own\ndecision. From a young age I've been quite curious and didn't know how it all worked\nso I think that has been the biggest influence- just that I didn't know what went on behind\nthe scenes. Ten years ago, the job I was doing I wasn't enjoying all\nthat much, so I thought about trying something different. I remember it helped out involving\nthe electrical work, I quite enjoyed that. I was doing a sports course for a year at\nHighlands College. I didn't know whether I wanted a career in sport or a career on the\nbuilding site, so I decided to do the sports course for a year and see whether I liked\nit. So I finished the year and realised it wasn't really for me, so I decided to get\ninto the electrical trade. I did English, Maths, Science, History, ICT,\nDrama, and PE. Initially I did the NVQ level 3 in electrical\ninsulation and I did the 16th edition and then the 17th edition, and then after that\nI carried on and did the 2391 inspection and testing. I think probably confidence, initiative, and\nlistening skills. Perseverance, being able to adapt to a change\nin circumstances and a good sense of humour I think. I think meeting new people everyday on the\nbuilding site, meeting people from different trades, and just having the banter on the\nbuilding sites really. I've come to this job quite late in life and\nI'm learning all the time and I'm really enjoying the learning experience on the job. From how much goes on behind the scenes. People\nthink it's just putting plug tops on wires and stuff but there is so much that goes on\nthat people don't see. The advances in technology are vast so that's\nthe biggest thing that's surprised me. People think it's an easy trade, think it's\nall clean, but you don't really know until you've been on a building site and see what\nactually goes on. Go to someone's house and they say they want\na socket put on the wall. They don't realize they might have to chase out half the wall\nto get it in, and have to decorate afterwards, they think you're just going to stick a socket\non the wall and it's done. Getting the job at Brady & Gallagher. I worked\nthere for three months on 'Advance to Work', and then getting the job at the end of the\nthree months after my trial. I think that was the biggest highlight. The biggest highlight so far has been able\nto come down to this island from up North. Maybe it can be a bit repetitive sometimes\nif you're on a big building site, but apart from that I can't really say there is. I think it can be a bit frustrating sometimes\nwhen you're trying to do a job and things aren't going your way or you're hitting snags.\nIt can be frustrating when things take longer than you expect. I think the biggest challenge was my first\nexam at college. I was nervous for it, I didn't know what to expect. I just overcame it by\nbeing confident in myself and believing I could get that first exam out of the way and\nstart off my college work. I think the biggest challenge so far has been\ntaking the inspection and testing exam. Be confident within yourself and make your\nown path and make your own decisions and mistakes and then make your way from there. Don't be afraid to try different things. If\nat first you don't try one thing, try something else. I think it's brought me good communication\nskills with adults. Being on a building site, I'm usually the youngest on the building site,\nso being able to talk to older people and they can pass down their experience and knowledge\ndown to me. I think that's the biggest thing. I'm from up North, so I've been able to come\ndown to here and work so you can, you can travel all over in this job. I think you could do if you wanted to, maybe\nwhen your qualified, because the qualification is known worldwide. So as soon as you are\nqualified you can take it wherever you want, and you could meet new people and work in\ndifferent countries. When you install something and you first switch\nit on and everything works! I think the biggest thing that makes me smile\nis overcoming a challenge- something I don't know how to do, or something someone's shown\nme how to do, doing it for the first time and getting it done properly."

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"VideoID": "1468",

"Title": "Top 5: The Best Selling Industrial Electrical Controls &amp; Indicators on Amazon",

"URL": "https://www.youtube.com/watch?v=C7Qw3q2NeM4",

"Keyword": "Industrial electrical construction",

"Transcript": "welcome to bests sellers Market where we dive deep into the World Of toprated Products today we're embarking on a thrilling countdown of the finest in industrial electrical controls and indicators available on Amazon prepare for an exploration of innovation and Excellence as we highlight the best of the best in this essential category buckle up and get ready for a Showcase of products designed to elevate your industrial projects without further Ado let's go and now at number five on our countdown of the best sellers in industrial electrical controls and indicators we have the riand 7 to70 Vol pwm DC motor speed controller switch 308 this powerful tool is designed with a broad voltage range of 7 to 70 volts and a high current capacity of 30 amps making it versatile for a variety of applications imagine the Precision at your fingertips with an onboard switch that off offers run stop and breake functions all built into one Sleek unit the potentiometer is cleverly designed with a soft line that can be separated and the wire length stretches to a convenient 15 cm it circuit boasts an optimized design with a wide duty cycle adjustment range ensuring smooth motor operation with no buzzing sounds or vibrations it also features a power indicator reinforcing its stable circuit design that's ideal for prolonged use this this controller is tailored specifically for DC brush motors and requires a separate DC power supply connecting it to an AC power source or attempting to drive a brushless motor is a no-o prior to wiring it's crucial to read the wiring label the input must be connected to the DC power positive and negative poles while the output connects directly to the motor without polarity concerns if you notice any issues with motor Direction simply swap the two motor wires adjust in the duty cycle allows you to control the onoff time translating into precise speed regulation with no load you can use a voltmeter to measure the output voltage which should be close to the input voltage connect it to your motor and adjust the duty cycle to see changes in average voltage and consequently speed remember voltage changes affect current so keep an eye on both for Optimal Performance the Rian 770 volt pwm DC motor speed controller switch 30s stands out for its durability efficiency and userfriendly design making it a top contender in our countdown next up in our countdown of the top sellers in industrial electrical controls and indicators at number four is the universal bathroom vent fan motor replacement electric motors kit sm550 this motor kit is designed with Precision to fit a wide range of applications and it's your go-to solution for replacing old or malfunctioning bathroom exhaust fan motors operating at 120 volts with a 60 HZ frequency this motor delivers a robust 50 CFM airf flow with a current draw of 29 amps and a high-speed 3000 RPM if you're dealing with a newtone bron 65100 or similar models this replacement is tailored for you the kit includes everything you need one motor and one fan with a 4.5 in flat paddle style blade the shaft dimensions are approximately 3116 in x 1 3/4 in and the wire length extends to 8.5 in complete with a convenient two-prong plug for mounting the studs are positioned 178 on Center and the coil stack measures 5/8 versatility is key with this motor it's a direct replacement for several models including newtone brone upco venola e498 D1 Bay Motors Sears 569 Dayton and many others what's more it features reversible rotation both counterclockwise and clockwise ensuring it fits your needs no matter the setup it can replace models like 651 vfm 100 c658 78 33100 82 423k em 550 k111 em 740 7844 a 676 d2676 F 763 rln and more built for durability and performance this motor kit offers premium quality and for your peace of mind mind if for any reason you're not completely satisfied you can request a replacement or a full refund no questions asked the universal bathroom vent fan motor replacement electric motors kit sm550 is a reliable choice for keeping your ventilation systems running smoothly and efficiently at number three on our countdown of the top sellers in industrial electrical controls and indicators we present the foot switch normally off press and hold to on on with a 10 fft UL cable and plug this versatile foot pedal is engineered for hands-free operation adding an element of convenience and efficiency to your power tool setup imagine a world where you can control your equipment effortlessly just press the pedal and hold to turn your tool on then release to turn it off it's as simple as that the design features a front pivot that minimizes user fatigue supported by three stable plastic points this means means even when you press the edge of the pedal it activates smoothly and reliably the foot switch boasts a plug-and-play setup equipped with a UL certificated us3 prong piggyback plug allowing you to connect your device directly to the switch with ease and let's not forget the UL certificated flexible cable crafted with three cores and 188 Ag and extending a generous 10 ft this Cable's flexibility ensures that the foot pedal remains stable and doesn't flip around around during use providing consistent and reliable performance IDE deal for use with a variety of tools including lenberg machines table saws scroll saws and miter saws this foot switch is a must have for any Workshop its momentary switch feature handling up to 15 at 250 vac delivers Dependable control over your equipment the foot switch normally off press and hold to on with its 1050 UL cable and plug stands out for its practical design design ease of use and highquality construction perfect for enhancing your workspace it offers the flexibility and reliability you need for Optimal Performance are you enjoying our countdown of the top sellers in industrial electrical controls and indicators on Amazon if so don't be shocked give us a thumbs up subscribe and press the Bell icon so you stay plugged into all our latest updates coming in at number two on our countdown of the bestell in industrial electrical controls and indicators is the Bojack one pole F 30 amp coil 24 vac air conditioner condenser compressor contactor this component is the epitome of reliability and efficiency designed to meet the demanding needs of your electrical systems let's dive into the specifics this AC contactor features a single pole configuration making it a robust choice for various applications with a rated current of 30 amps it's built to handle substantial loads with ease the coil operates at a standard 24 VC providing consistent performance and seamless integration into your existing setup but that's not all this contactor is engineered to withstand a maximum voltage of 600 VC ensuring it can handle even the most challenging conditions without breaking a sweat whether you're upgrading your air conditioner condenser or managing complex electrical systems this contactor stands up to the task with impressive durability and reliability the Bojack 1 pole F 30 amp coil 24 vac air conditioner condenser compressor contactor is designed to ensure your equipment operates smoothly and efficiently providing a Dependable solution for controlling High current loads with its highquality construction and Superior performance it's no wonder it's a top seller in its category at number one in our countdown of the top sellers in industrial electrical controls and indicators we proudly present the APPL 16 mm latching push button switch with LED angel eye head this switch is not just a component it's a Marvel of design and functionality let's explore what sets this switch apart the APL 16mm latching push button switch features a sleek black shell with a captivating LED angel eye head designed for a 63in mounting hole it brings both style and practicality to any setup the switch operates at a precise 12volt DC making it a reliable choice for a range of applications the Brilliance of this switch lies in its Simplicity and durability with a latching mechanism a single push turns it on and a subsequent push turns it off perfect for intuitive control the contact configuration includes one normally open and one normally closed terminal ensuring versatile connectivity built to last this switch boasts an impressive electrical life of 200,000 cycles and a mechanical life of up to 1,00,000 Cycles crafted from highquality metal and equipped with ip65 waterproof protection it excels in both wet and Dusty environments maintaining performance under challenging conditions and here's a standout feature if you encounter any issues within 3 years of purchase excluding man-made damage you can get a replacement no questions asked asked this commitment to Quality underscores the reliability and robustness of the APL switch with its durable construction elegant design and high functionality the APL 16 mm latching push button switch with LED Angel ey head claims the top spot in our countdown it's the ideal choice for those seeking a switch that delivers both performance and Longevity we hope you enjoyed our countdown of the top industrial electrical controls and indicators on Amazon on to keep up with all the best sellers hit that like button subscribe and tap the Bell icon don't forget to check the pinned comment for links to all the featured products thanks for watching and see you next time"

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"VideoID": "1476",

"Title": "Industrial Electrical Power Explained",

"URL": "https://www.youtube.com/watch?v=3w1G3YgVjag",

"Keyword": "Industrial electrical construction",

"Transcript": "well good afternoon everybody as you might have guessed i'm very excited to have our guest on this week and it's a topic that is relevant for anybody involved in industrial real estate whether you're a tenant whether you're a property owner or someone just looking to learn more about industrial real estate uh electrical power which is what we're going to be discussing uh today is critical and it's i've found over my career that it's one of the most important aspects of a of an industrial building but it's also one of the least understood so i asked in an electrical engineer bryce to come on the show and we're going to dispel some of the notions about electricity we're going to go over some of the key terminology such as single phase versus three-phase talk about amps wattage voltage uh and some of the things that people are going to want to look out for whether you're a tenant uh leasing or buying space or whether you're a property owner who's going to be a landlord there are some key things that you're going to want to know and i think bryce is going to do an excellent job of talking about these so wyatt if you can bring bryce on bryce thank you once again for joining me on this call thanks for having me i appreciate it so i'm quite interested in this as well i i've got a little bit of an idea on on power and electricity in general but i'm also quick to defer to the experts i never want to be putting myself out there as either an electrician or an electrical engineer such as yourself but i think it's also important to have a high level overview so you can at least have a discussion with whether it's a tenant or a property owner to talk about some of these key key ideas and key terms so i thought that would be a natural spot to jump into is even just talking about the difference between single-phase and three-phase power and where each are used and why they're used yeah for sure so when you have an industrial building or any building in general typically what where you start out with is well you need to know what equipment is going in is it lights is there other motors what size of the equipment so first you start out with everything that's got to go in the building once you have an idea for the equipment that needs to go in then you have to start figuring out okay well we need to power all the stuff that use electricity so then from there you have to start looking at the equipment that's going to be going in it can all come in different voltages and different power consumption requirements and so from there all the equipment can either use single phase tip or three phase power so single phase power is uh typically like 120 or 240 volts for at least our geographical area in like alberta state canada and so and then there'll be three phase power and so the difference is usually basically the number of wires that are coming in and each wire carries an electrical signal on top of it and the signals are not exactly the same to each other but when you have equipment it'll be often rated like 120 volt single phase or 600 volt three phase and so based on the equipment that you're going to be putting into your facility you typically need to sort out if you need to first of all get single phase power into your plant or three phase power and so for example for an industrial facility often we'll pull in a higher voltage like say 600 volt three phase power and we'll do a step down transformer to off to the side still have access to 120 volt or 208 volt single phase or three phase power so typically for an industrial facility you're going to be looking at using some more heavier hitter equipment that takes more power so you come in with uh with a higher we'll call it higher voltage um there's different classifications of voltages but a lot of it comes down to that you there's a relationship between voltage current and resistance in the electrical world and so there was there's a map behind it but often what you'll do is if you have a piece of equipment that needs a certain amount of power if you have more voltage then you need less current in order to meet that same power requirement so a lot of the times we'll come in with a little bit of a higher voltage so that we have to have less current on site which lowers the size of your wires quite a bit and uh just the current often causes overheating if you have a lot of it so it keeps things a bit safer if you can lower your current so there's different engineering stuff behind the scenes and a lot of this just links down to there's there's canadian electoral code and national electrical code for uh north america there's different electrical codes that ultimately help guide the ship on there's all these legal requirements that a system has to have in order to operate and so part of the electrical world is you have engineering and then you have like utility so utility they're the ones that they charge you for electrical usage versus the infrastructure itself has to meet like the electrical codes and all the legal requirements um everything having jurisdiction so often it's recommended that for an industrial facility you'd have an engineer involved who understands the codes the legal requirements that can take professional liability for the design to ensure that it's safe accurate and functional to meet all the codes but also can technically just perform and meet the needs of the facility whether it's a water wastewater plant whether it's pulp and paper there's all different types of industries but and each type of industry often has its own codes associated with it maybe that's a good place to to move over to is was how you mentioned that it it was really dependent on the tenant or the company that's in there that's going to determine how much power they need which will then set the requirements for what the what the building will either have to have or be brought in so let's let's maybe uh look at that area first how does a tenant or or company if they're buying it how does a company look at how much power requirements they're actually going to need what's what's the process involved in that and a typical tenant probably won't know that they'll say well here's what i know um i need a facility that is going to distribute water to our our town so that's what we know now we need someone that can actually accurately tell us what that even means so often a typical tenant will advertise their they'll they'll ask for a proposal they'll say here's the goal that we want to accomplish they'll publicly advertise it and they'll say hey engineering firms can you help us out with this we'll pay you to figure out all the stuff and provide the recommendations so then engineers would like bid to do that work if they get the job then they're going to actually do all the work behind the scenes so that then the engineer would come in they would do like hydraulic water analysis can figure out pop by based on population of the area how much water needs to be supplied once you figure that out then it's like okay now that we know how much water we actually have to deliver to this area let's now figure out what kind of equipment can even distribute that so then you have pumps pumps they just rotate and they move water so pumps all need different types of there's different horsepowers of pumps is the often term that you'll hear for pumps for example so the engineering part of it is to figure out the equipment that can actually provide the needs of the tenant in this example it's uh it's water it's providing water so the engineer will first then figure out what so we've got the water that's going to be needed now we start figuring out equipment well what pumps out there on the market can actually provide that amount of water movement so then from there now you start adding up all your equipment so you have this equipment list with all the different horsepowers and loads so now that you know that there's 250 horsepower worth of equipment that needs to go into this facility just to move the water then you also start looking at okay we also need lights receptacles we need some heating and ventilation units for the for the building are there any other processes that we have to have in this system as a whole so once you have this master list of everything that needs power that can all get converted into a number like kilowatts that's what utility likes to see they like to see like how much how many amps is this site going to need and at what voltage and what are your what are your loads like what are your motor loads so they actually have these kind of questions that they want to know upfront and so that's where you kind of need to know the equipment that's going into your facility to meet the needs of the tenant and sometimes that equipment is only available at certain voltages and powers if you're going to buy a 100 horsepower pump you're not going to get that at 240 volt single phase so sometimes you're limited by just the reality of what's on the market and what products physically exist in order to actually provide the needs of what your tenant is looking for yeah that's really interesting and it reminds me of of a development that's that's occurring right now where we're starting to see more robotics go into some warehouses like some of these distribution companies are starting to incorporate more robotics and for the most part if they were just a distribution company they probably had a minimum power requirement like you said they still need the lights and the the hvac and the different equipment in there but these companies didn't necessarily have a huge power requirement before but if these companies are now going to start incorporating robotics which i think is going to be a trend going forward that's going to require that much more power in there so is it the similar process where you're you're you're trying to analyze what draw those robotics are going to have from a power standpoint and then incorporating that into the overall plan yeah exactly and that's where a lot of the engineering challenges can come into play is when you start with an existing facility that all of a sudden you're really going to beef up and add a bunch of stuff to it sometimes at that point if you can't even get equipment in that same voltage range of what's already the site sometimes you have to upgrade your facility upgrade your site service so the ideal case in those scenarios is you already have like your utility company already has three-phase power infrastructure developed in the area because then you're just doing a site upgrade with utility you're coordinating that they're going to just kind of provide some additional infrastructure there might be a capital cost associated with that but typically um when you have that case it's it's more or less you're just working with utility to kind of upgrade a few pieces of infrastructure you'll probably have to provide some new cables and some electrical distribution equipment in the building but that's an easier retrofit where you get to a bit of a crunch is when you don't even have three phase power available in the area from utility in which case then that's where you enter some oddball cases of like okay well do we need is there just one piece of equipment that needs three-phase power or is like is there a lot of things because there's options one is you gotta work with utility to upgrade to provide three-phase power to site that can be costly sometimes it can be a hundred thousand dollars per kilometer of newly developed electrical power lines and distribution uh sometimes it'll be like okay well 85 90 of things can actually still be single phase it's just this one thing that needs to be three phase so then they're like there are single phase of three phase converters and there's also for example for my industry water wastewater if we have pumps that need three phase and they're small we can use different technology like variable frequency drives to convert single phase power to three phase power they basically do they already do that conversion integrity they can do that conversion integral to its product if you spec it out properly and then you can just power that one load that's the oddball outlier with your three-phase power so once again it comes down to what the equipment is rated for what it needs and what it can be specified as if you just can't buy that product in single phase and you have to go three-phase that's where as engineers for example we have to kind of take that as like a design challenge and sometimes there's more than one solution to get to the end so it's up to us to try and figure out what is the best solution to get to the end which includes not only just the economic side of things but also the safety and the reliability if you have to put in 10 things that can each fail to get to your solution but and it's cheaper slightly cheaper than just doing a more robust solution maybe it's better to spend that extra income now for that extra capital cost now to provide a more reliable solution than something that at the moment could be cheaper but it's less reliable yeah that's an interesting point um and why i just put up a banner there uh if you do have any questions for bryce please feel free to to ask them in here as well we'll try to get to as many as we can and i saw beverly joined in uh beverly thanks for joining in uh but yeah encourage you to ask any questions uh so i i want a hypothetical situation here let's say there's a company it's a cnc company so they do they have some lathes and some mills and they want to get an idea of how much power they're going to need in a building so they hire an electrical engineer and you come to them you you audit the amount of equipment machines and lighting and hvac how what do you present them with in terms of what specs they need to find in a building yeah and so that's a good question normally what we would do on the engineering side of things is we have like single line diagrams we're just a block diagram that shows right from utility utility comes in and then we have to incrementally show each kind of piece of equipment each load as we go and typically just develop either like a chart or an itemized list of all these different loads or on your diagram you'll have all the different higher loads so often we'll be calculating out your expected demand and your peak demands uh based on like what the process requires off to the side and ultimately that's going to be going with utility utility is going to be asking for that basically that load list or at a minimum uh how much amperage is going to be coming in now there's there's peak demand and there's typical operating demand so we have to look at what the worst case scenario is all your equipment's turned on that's that can be turned on together that's expected to be turned on together and also just like on your average day what equipment is turned on so you have two different scenarios we take those together and util utilities have application forms and application processes and usually they're looking for those numbers and so whether it's tabulated off to the side on the engineering side the electrical realm single line diagrams are kind of like the the main electrical drawing that would capture that kind of info and it's just a schematic level block diagram kind of flow of how the electricity comes to utility it goes to your distribution equipment that points at different equipment with breakers and says that load gets this much of electricity that low gets that much electricity and it breaks it out so it's spread over your page and then from there now you know at a glance you can just see on one or two pages your entire facilities loads and then from there it started it gets a little bit easier to visualize like okay now as an engineer i can see that we need a box over here on the wall to manage distribution to that equipment and that then collectively that all funnels back to utility and utilities kind of the key thing there where you can't you don't have power unless a utility company provides it unless you're gonna power your facility with like a generator or something like that that's but that's kind of i guess a separate kind of beast so for now we'll focus i guess on utility and assume that a utility company is involved and so ultimately it will it comes down to knowing the loads that your equipment needs to have and that's why there has to be like a design process to really lock that in you might know up front like maybe it's somewhere between 200 and 250 kilowatts that your site will need but it's not until you get into the reads of the design to lock things down and confirm those calculations where you can actually shore that up and say oh it's actually specifically 185 kilowatt is your expected peak demand so from that now we can go and ask utility company hey based on this i need a 200 amp service can you guys do that for us is that oh sorry to interrupt is that a natural like is that the calculation like is you determine the kilowatts that you're going to draw as the tenant and then it corresponds to a certain amperage so uh voltage uh so power is just voltage multiplied by your current so that's there's a relationship between voltage and current so when you look at like uh say a pump data sheet it will tell you how much current it's going to pull at what voltage so when you do the math with the voltage and current relationship that gets converted to kilowatt and kilowatt is kind of a unit of power like wattage you know if you buy a 100 watt bulb for your lights versus a 60 watt bulb the 100 watt bulb is brighter than the 60 watt and that's because it's using more power to produce more light similarly with any device uh if it's going to do more work it needs more power and so the the watt is just a measurement of how much work that piece of equipment is going to be doing so the more the heavier hitter equipment a pump that's got to move a lot of water uh will might have a higher horsepower than something that really doesn't do much and so that's where it goes back to the engineering side of things where we have to confirm the equipment that can actually perform it it can physically do the work to meet the needs of the tenant whether it's moving water whether it's manufacturing pulp paper all that kind of stuff when we talked a week ago or so you had a good analogy for the difference between amps and voltage can you share that again yeah so um just think at a high level it can be hard to visualize what's happening with electricity because we can't see it it's happening in cables we can't see but if you envision like a river uh so the the force of the rift if you're gonna go floating in the river the force of the water would be equivalent to the voltage the flow rate of the water would be equivalent to the current and then the rocks that might be in the middle of the river that would be like resistance and so often the there's a relationship for electricity is voltage is current times resistance so you kind of think of it like the force the river is like the flow multiplied by your resistance the rocks in the water is kind of um a cheat way to kind of envision what's happening with electricity and the wires yeah i think that's a great analogy and it i might seem like i'm really asking you to dumb this down to my level but but i don't have nearly the knowledge you do on electricity so i really want to try and simplify this as much as possible so i i'm a tenant i've got a list of of requirements on what i'm going to have for load and you've got the peak load as well as what your typical operating load is going to be so use you would come or the elect the uh engineer would come and say you should be looking for a building with 200 amp power three-phase are you going to say what the voltage is as well or is that enough if you get 200 amp three-phase is that enough information for a tenant to go and find a building and have comfort that it's going to serve their needs uh the voltage the voltage does matter um on the so the utility company is going to provide a transformer that is going to step down their power line voltage down to the voltage that your site needs now the the voltage on the power line is typically very high and that's to minimize the amount of current that's flowing through all those wires because as you provide the same amount of power voltage times current so if you increase voltage you can lower your current so uh the catch is the utility company's typically the one that provides that transformer to step down from their voltage down to your site voltage so at some point it will be relevant what voltage it is but at a minimum as just a preliminary gut check if you just want to try and coordinate with utility to be like hey i know that i'm going to need three-phase power utility company do you have three-phase infrastructure developed in this area here's my legal land description here's my address my civic address where this facility is going to go can you guys advise if there's three phase in the area and then if they say well yeah it looks like we have uh looks like we have infrastructure developed in the area then you're like cool so i can proceed with getting you more detailed specific information but knowing that you're not just going to reject my application because you guys don't even have that voltage in the in the first place the ability to get us the so really that points the phase does matter more at that point to know if you can even because once you're once you know there's three phase available you can do 208 208 volt 3 phase you can do 600 volt 3 phase 480 volt 3 phase there's higher voltages to where you get into like medium voltage category which is like over a thousand volts and so it's a lot of it just comes down to the equipment that you're going to be putting in and what it's rated for and so it's kind of i guess a bit of a chicken and egg thing where you still have to have an idea of what kind of equipment is going to be going in so that's where a lot of projects they'll do preliminary design and then detailed design now preliminary design is flushing out all those minimum requirements enough that you can make an informed decision on how you want your facility which route to be taken then detail design is locking in the very specifics so and this might be an obvious answer for for you to answer but it's still just a question that i would have so a tenant's looking at a building it's advertised 200 amp 208 volt three-phase wire and they've reason to believe that that's that's been confirmed uh is that enough for you to go on uh as a tenant to say okay this we believe that this is what the power is in here we believe that this will meet our needs is that enough to go on or do you have to do a much more detailed analysis to actually confirm that if uh if it's unknown honestly the easiest way is that building is getting power from a utility company somewhere and though there should be like a transformer something that has a serial number so you should always be able to go back to utility company even if it's just the address of the place and confirm it with them a utility would have the records of anything that they're providing power for because they're going to have utility meters that are measuring the amount of power that can actually confirm and those utility meters will often have a lot of input on them as well so if there's any skepticism on what even power is coming into that building um usually the most reliable way to confirm that is to look for the electrical infrastructure that is actually providing power into that building and then go back to utility would be the preferred way to probably be recommended to go if there if you're just like in limbo land and you don't know for sure yeah and anyone that's tuned into this i i echo all your comments bryson just a quick story that this actually happened to me about 10 years ago we were looking at a building and it showed the panel inside the building was a 200 amp power that's that was was marked on there but when these when we actually started working with getting servicing in there the electrical the service providers said there was actually only 100 amp so what turned out is that and there was a lazy uh electrician out there that reused an old panel which just happened to be a 200 amp panel but they put it on for the 100 amp service so i i would just encourage people that even if it does say that the last thing you want to do is is warrant or represent that that's the power that's going into the building only to find out that it's something different altogether so and like you said earlier bryce there's two components to it there's there's the panel and the infrastructure in the building itself and then there's also the service provider that that does it is that typically like a an easy process to go through to just call the utility provider and ask them what service they have going in there it depends on the utility company some of them are some of them will ask you a lot more like well why do you do this info what are you doing so they might try and get more info to confirm i guess the reasoning on why you're doing it um if you're phoning on behalf of a tenant then often they won't release that info to you without having a third party authorization sign off from the actual owner saying well i was given permission to talk to you on behalf of them because i'm the one that has like the technical background that knows what i'm talking about so that's that's kind of as long as you have authorization working with utility companies they're pretty good usually so that's fine but kind of going back to your panel idea your item there uh so there's equipment has it's what it can be rated for what it's first is what it's actually using so you can have a 200 amp rated panel which means you can get up to 200 amps going into it but that doesn't necessarily mean that it's using 200 amps and that's kind of where it goes back to like cables can come in all different sizes different diameters the the bigger your cable the more current it can pull and the insulation has different voltage ratings so if you don't have the right cable already connected to that utility transformer that's a bottleneck where it's like oh so you want to upgrade your facility from 100 amps to 200 amps of of current being pulled that's good that's cool but it can the cable even handle that upsize because a lot of our retrofit jobs that's part of the process is we assume by default unless we can prove through like field investigation that the cable also has to be replaced and up-sized to the appropriate cable that can pull the amount of power the current and so that's where if we're going to be doing a retrofit to an existing facility sometimes there's a little bit more infrastructure other than just getting the utility transformer upside sometimes you actually have to take out all the wire and even if your panel has capacity to take it you might add salt to rip out all the wire going to it just so that you can properly and safely operate your system yeah and that i'm glad you brought that up because that is a question that that comes up quite often especially in in like a multi-tenant building where there there might be you know eight to 20 different tenants in there uh and an individual bays as a result it quite often comes up that one tenant needs to perhaps double their power so maybe it's 100 amp three-phase service in there right now and they require 200 amp it's it goes beyond just whether this that amount of power is even then building it's whether that the cabling can handle it so what with without giving like numbers that that are concrete but just even like a gener generic idea so people can have an understanding of it what's typically the cost involved even on like a soft cost on going and doing these these studies on whether it's even feasible to the hard costs and again you just give like a ballpark it doesn't need to be because everyone's going to be in different areas and and it's not going to be the same but just ballpark for soft costs and what people could expect and then also on the hard costs knowing that every building is going to be somewhat unique and and scale in size yeah i guess it would depend on how how complicated your site if you're talking to like a single building that you're looking to analyze it could be like in the tens of thousands of dollars to try and like figure out all the specifics um and make sure that the uh the engineering recommendations behind that are considered so i'm kind of thinking like this is like a design report that an engineering firm is looking at collectively everything so it's like we're going to look at your power requirements we're going to look at your uh we're going to look at also like to meet the needs of your facility the process is gonna we're gonna analyze the process to confirm the equipment selection if this is a big detailed report that's telling you everything about your ability the electrical portion would probably it should be it probably in the tens of thousands i think would be the rough off the top of my head guesstimate on if we're going to properly analyze everything and it's a true retrofit um retrofits cost a bit more upfront to figure out as opposed to like a new project if you're going to build a building brand new usually on the engineering side it's we'll call it easier because we we we get to write from the beginning and down we can just put in all the requirements we can start all the calculations right up front and get that all tailored versus a retrofit you have to do some recon you have to look at existing as built you have to potentially do some site investigation and go to and actually open up panels and worst case you have to have to have to have someone like expose that line which could be underground so then all of a sudden that now you have to rent equipment to expose that so that's where costs can really start adding up in a retrofit investigation depending on how accessible things are in sight and if you can even find that info how accurate as built info is um so it does it does vary but we call them like greenfield projects versus brownfield the greenfield project is you're building it fresh brownfield is like a retrofit so greenfield projects we would kind of start with the end result of like well here's all the equipment we need then you start working backwards towards the utility line to get all the infrastructure developed and sized appropriately right off the bat as opposed to if it's a retrofit you kind of have to go the other way around and see like what's my bottleneck and limitation utility service is only this size which means the cable here let's look at that how big is that cable so then you have to start figuring out well based on this you can't even connect all of that process equipment without upgrading your whole like service size and your cable and that panel has to get up size so retrofits often have a little bit more design work up front in order to figure out flush out those bottlenecks yeah well said i want to go back to the uh part you mentioned a couple times about the transformers uh and and that's basically just to step down the power so if this the utility provider is is bringing in a certain amount of voltage but you have to step it down for the equipment that's in there i i've noticed that there's some buildings that that don't have a transformer is does that just mean that the transformer is perhaps on the power line like like what you have in the picture behind you uh or does does every building require a transformer to step that down or are there different scenarios uh there's i i have yet to see a case where there hasn't been a transformer on any projects i've been on but there's there's pole mounted transformers and then there's pad mount mounted transformers now pole mount is a transformer that looks kind of like a big cylinder that hangs on the pole versus a pad mount transformer is on a concrete pad on the ground uh typically close to your facility and it uh the usually kind of a smaller service we'll have um will have a small pull mount transformer like say up to 150 kilowatt uh facility might have a pole mount transformer and then anything up from there might have a pad mount that exact number is not concrete it changes based on geography and your utility provider and their standards and what you request sometimes you can even request one versus the other if it's in between the sizing requirements um but in if you're in like a town a lot sometimes they might already have like developed like a distribution system that you have to work through like the city to get approved and they'll kind of deal with that on their side so uh if you're doing just a standalone industrial facility often um the typical is that there's a utility transformer involved although there might be some few special exceptions there where uh they might use like a big they called like switch cubes where it's like a box that you can tap eventually it reaches either like a substation or a transformer or something but um whether or not it's like really obvious and right next to your facility versus it's more upstream um usually at a minimum that still has to get that those specifics will get flushed out when you are talking to utility because once again you need you can't power anything without power and therefore those that provide power are the ones that can advise on specifically the infrastructure that they're going to be recommending to get put in whether it's a transformer whether they just say oh just provide a conduit to the property line we got you we got your back we got you covered from there um sometimes utility will have special infrastructure already in place that's very interesting uh so is there ever a scenario where you would step down the power that comes into the building and then step it up if you've got certain machinery that requires more power or is it is it only ever stepped down the the typical from the engineering side of things is you'd come in with you'd come in at the hot you'd step down your transformer from utility to the voltage of your highest rated equipment and start there and so uh think about that so you do a step down transformer outside from utility then you come into this big enclosure that manages like 1000 volt kind of thing and then from there you might have other equipment that needs 600 volt so then you'll do a step down another step down transformer that would be customer supply not utility provided and step down to 600 volt and then do another big enclosure that has all breakers in it and then you might have lights and receptacles that are like 120 volts then you do another step down transformer either from the 600 volt system or the 1000 volt system both are options there and then have another panel that distributes so you end up having these different boxes you can envision them side by side each one handles a different voltage and each one has had stepped down incrementally as you go different voltage levels and so then you pull from the different boxes that have all the different voltage uh the different voltages associated with them to the respective equipment that needs that specific voltage so i i personally wouldn't haven't seen a project where it's brought it down and then brought it up normally the typical is you start incrementally decreasing your voltages down subsequently yeah and that makes sense and i think that that just underscores how complex this topic really is uh i've been in the industrial space for a while and i still have a layman's level knowledge on on this topic so i think everything you've said so far has really just illustrated that it's a complex process and you need to have the right people on your team going through this but what i really want to emphasize to people is that don't take the subject of power lightly because if you overlook one critical component either as a company occupying the space you might have insufficient power for what you need in there or if you're a property owner who buys a property that has insufficient power then as you could hear from bryce it's a lengthy process of going through the engineering to figure out what's even capable of upgrading it dealing with the service provider and then just the cost of it i i can't emphasize enough how important it is to do your due diligence on that either as a company or a property owner beforehand to avoid uh running into a potentially unfixable mistake so i i really encourage uh people just to keep power uh top of mind particularly as we're going into this uh environment where there's just gonna be more power demand for everything there's gonna be more of that broadband connectivity which is going to require power more robotics more more things just connected to everything uh so really keep power on the on the top of your mind and uh i do want to get to some questions here because i i had one come in from ron rhody on twitter and and and i don't know this might be the same as as you answered on another question bryce but perhaps you can just take it in whatever direction you want uh but he was asking about uh tracing wires for dead outlets or lights uh and in the context of like a large industrial parcel of land uh so maybe it's outdoor storage maybe it's a lay down yard whatever it is uh if you have uh dead outlets or lights on the site is it worth trying to trace where all those wires are going or does it make sense to just trench a new line altogether yeah so if if you can assume that the actual like receptacle lighting is all still in good condition and can continue to be reused so yeah the fork in the road is can you try and reuse the existing wiring and infrastructure or do you just run a new one and whether you abandon the other one in place or whether you try and rip it out after the fact but um a lot of it comes down to in that case first we would probably recommend that if you're gonna attempt to reuse the cable you can do what's called a mega test which is where you check you can use different voltages and instruments to monitor how good the insulation still is in that cable there's a there's some minimum threshold requirements for what value would be a pass on that test and what would be a fail if it fails we would just say okay well end of story don't use that cable you're going to need new cable anyways and if it passes you can still look into it but if if you're trying to rewire using existing wire that's where it's like well you still need to kind of know where that wire is going if you're going to repurpose the cable you still need to have an idea where it is and so that's where you might have to perform some sort of excavation and there's different ways to do that there's like you can manually check it out um you can hide your back and actually it's like exposed underneath what you don't want to do is just kind of like dig with like a backhoe and just you know you end up hitting the cable or the conduit and you break it well now it's kind of a different beast but uh it's but if you are going to be attempting to do reuse existing external infrastructure um at a minimum i would say you'd want to first even see if you can use the cable and if you can then usually you're trying to physically locate it if you don't have any sort of as built information that actually verifies where that is then typically you still want to try and expose it to confirm if you need to see where it's going if it's simply the receptacle is there and all it is is in the building there's just this wiring that has yet to be connected then in theory you can still use that and extend it out to a new panel a new power source and re-energize that equipment but at a minimum you'd want to do those field checks to confirm that the equipment is still reliable functional the cable going to it is still functional and sized appropriately and um and then kind of go from there yeah good answer just to backtrack one more time because i did have another question about of a building so if a property has and and we'll just use arbitrary numbers again let's say it has 400 amp power it's three phase it's advertised as 208 volt and assuming that there's a transformer on there either a pole mount or or a pad for a company that perhaps needs 600 volt is it right to assume that that 600 volt can be there by changing the transformer or does that require something more robust uh typically if you already have two eight volt three phase for a transformer i would be very surprised if utility can't just swap out that transformer for something that has a 600 volt secondary uh because the the the voltage on the line should be like like one typical for my geographical areas like 15.6 like kilobolt is what that line is so as long as it's like less than that then you should be good to go so if we had to upgrade from a 208 volt three-phase service to 600 volt on our side normally it's just yeah you just have to kind of switch out that transformer the cable will be oversized at that point but oversized cable is fine um unless the cable's no good in which case we'd also just replace the cable and get it all new so that because that's another thing too you want to be careful of reusing too much existing stuff is everything has a life a life cycle to it and so if you're going to put in all new shiny equipment that's all brand new sometimes it's like well if we just do all the install is new you don't have to worry about checking out that existing cable every few years to see if now it's finally at the end of its life now you know like this whole system was replaced in 2022 therefore we should be good for like 25 years subject to operation and maintenance you know checking things out as required to confirm so you conceivably it should be easier easy enough to increase the voltage if if necessary but if it's single phase going to three phases a lot more onerous as well as going from 200 amp to 400 amp that that requires a lot more uh due diligence and uh i ident identification to see if it's even possible and then there's typically going to be a larger cost and time involved in that yeah yeah current upsize uh involves some additional utility infrastructure and it also affects like cable sizing as well as you have to check out the equipment inside your facility to see if you can handle that the biggest bane would be yeah if you were trying to upgrade from single phase to three phase that can be a potentially costly thing and that really depends on if utility has the physical infrastructure developed in the area to accommodate three phase i am actively working on a project where this just came into play and we're like well you can upgrade to three-phase service but just as an fyi like it'll be like a hundred thousand dollars per kilometer if we're gonna now start pulling in so it's like oh well that puts things into perspective that like maybe the better option is to so that's the example where we used variable frequency drives to convert single phase to three phase power for the one piece of equipment that actually needs three phase power everything else can be provided in single phase so we still get a 120 to 40 volt single phase service and then use those variable frequency dot drives to convert to three phase power for the dedicated equipment that needs it everything else is all single phase so now we don't have to spend a hundred thousand dollars to upgrade our service from single phase to three phase and then not understanding even the cost of doing that what's what's the time what's the time involved if you're trying to increase the current or you're trying to increase uh from single phase to three phase yeah that's a great question because utility would have to say well based on our current workloads and all of the people that have submitted applications we can slot you in for this fall so it depends on the reality of like how booked they are and where that fits into their timeline so unfortunately like as a tenant you don't really get too much of a say in the matter it ends up coming into like what utility can accommodate and so again not to beat a dead horse here but if you're a tenant or a property owner uh not knowing this in advance can can kill a deal i mean we all know time kills deals and if you have a property and you can't even bring in the service for six months call it because you're at the mercy of the utility company that that could easily kill a deal so it's it's incumbent on on tenants and and landlords to be getting ahead of this as quickly as possible so thanks for for clearing that up too bryce i think we had a couple questions come in here uh wyatt if you don't mind pulling them up uh is it possible to upgrade from single to three-phase warehouse investor uh thanks for the question i i think we've cleared cleared that up uh bryce it's possible but there's cost and time involved in it uh anything else you'd add to because i guess there's uncertainty too so it might not be possible yeah um like for example we there's one project that was like up in the mountains so it's just like you really have some special case scenarios that play about what you can eat like even do in those areas so uh it's it's usually usually kind of rule of thumb is it can be done it's just how much is it going to cost and utility companies will sometimes consider your facility an investment if your facility is going to use a lot of power then they typically will give you a discount on the capital cost of the infrastructure depending on how much power power you're going to use because they know that you you're going to be paying the monthly long term for utility usage so uh it might not cost you exactly a hundred thousand dollars if they say well first of all our baseline is we'll charge you a hundred thousand dollars per kilometer but because you're going to be using this much power per year you actually only have to pay sixty thousand dollars per kilometer so there are ways that you can still get discounts typically because utility companies often will consider in like an investment so then but um it's just be prepared that there will be probably be a capital cost investment to upgrade if there is nothing immediately in the area to determine uh if there's if there is no infrastructure in place four or three phase already yep and just from my own experience most industrial buildings in major markets have three-phase power uh most of them do i don't want to make a blanket statement there because the first investment property that i ever bought with uh with my partner ryan we uh it had single-phase power it was an industrial condo in an industrial park but they only had a single phase to it so we had to bring in a three-phase it wasn't crazy expensive that was back in 2014 or so uh but i think by the time we brought it brought everything up to standard and did i'm pretty sure we spent about 20 grand on it so it wasn't it wasn't cheap but it was possible and i mean that 20 grand is is definitely a a big number but it didn't kill the deal for us at least uh michael thanks for the question how does one know what voltage value a facility would use yeah that's a good question and typically that is at the mercy of what the tenant's needs is so for the process they want to accomplish they want to so if they want to do a water treatment plant that's going to treat water then you got to figure out all the equipment that needs to go in to accomplish that goal once you know that what that equipment baseline is that you're going to use you start looking hey let's see what voltages these products are even available in so once you figure all that out then you can start figuring out well there's a common factor a lot of this equipment is all 600 volt 3 phase so maybe we should push for normalizing the facility to 600 volt so uh part of the engineering of the design is to determine what that voltage should be and often that is directly linked to what voltage can all these different pieces of equipment be provided at because from there we can start honing in what voltage we should use for this facility a closely related question of that for a multi-tenant building where perhaps you'd just be consulting for one company that in a very simple scenario let's say it's a two tenant building and you're consulting for one of the tenants does that process also involve uh identifying what power will be remaining for the other tenant or is that more just the responsibility of the property owner to be determining it depends on if each of those tenants has their own dedicated utility service or if they're sharing a utility service because if they're sharing utility service then everything has to be considered together to make sure that collectively the single so what i mean by guess by dedicated service versus uh individualized or shared uh would be if you have one utility meter that is for the whole building that happens to be two different occupants with two different processes or did they each have their own dedicated transformer with meter going to it because if they each have their own dedicated meter and their own routing they can individually do their own things but if it's all funneled through a single utility meter electric then the utility meter still has to provide power through that single meter to both occupants so then at that point you do have to consider all the existing loads as well as the new or the upgraded loads would that also include like future loads so like as as an engineer i'm assuming in this two tenant building scenario that you would go in and say okay the new tenant needs x and the existing tenant that's already there has y so the building needs x plus y or are you is there any consideration given to the fact that 10 tenant y might become a different tenant altogether in a few years and they might have a different power requirement or they don't want to imply that that problem just gets kicked down the road but i i i guess what i'd really want to know is from the property owner's standpoint how do you future proof uh the building from potentially becoming a problem if there isn't enough power for tenant y a three years down the road yeah no that's an excellent question we've we've had to figure that out on several projects and by default utility i'm not going to say they don't care about the future loads but when it comes to sizing their utility transformer if you if you know you're going to put in future loads uh by default they'll say cool but for your immediate needs this is the transformer size that we would put in to accommodate so often like on the engineering side we'll still like provide the cable and everything size so that when that time comes all you got to do is just switch out the transformer there are some options where you can request an upsize transformer if you know that the existing one is just not going to cut it for when that future comes and sometimes the utility will just charge you additional little capital cost for that upsized infrastructure that they're like well you don't need this upsized infrastructure this is more money out of our pocket so we would like to get reimbursed for that so you can negotiate with the utility company as far as i know from what i've done i've been able to negotiate with the utility company to get an upsize transformer to accommodate for that future some sometimes utility companies will even ask you like what's your future loads and they may consider that in their transformer sizing as well but uh more often than not be prepared that if it's going to be a significant increase in size that at the time of that if you when that future comes you might have to swap out your transformer interesting um oh a comment from jd uh thanks for joining in jd he's a industrial professional in calgary so you're right in the middle of us bryce between me and jd uh hi chad and bryce i tell my clients i specialize in short circuits uh so contact your electrician to verify what you need here first yeah that's a great point is that the last thing someone wants to do is is make a disclosure about something and then have that liability on their hands so i'm i'm the exact same way i never want to claim that i know what power's in there unless it's verified by uh an independent uh source uh and and like you said bryce ideally right through the utility company because they're the ones that have have it on file and what they're actually feeding to the building versus potentially a panel and you said that very well it could be a panel that could handle 200 amps but it might only have 100 amp feed in there at the moment is that correct did i paraphrase that okay so i i guess just to summarize and and we can still take another question or two if anyone has uh something to ask bryce uh but just to summarize if you're a tenant best thing you can do is hire uh an engineer to determine your load whether it's an operating load or your peak load or both ideally and find a building that's compatible with that requirement so i i think that's pretty straightforward and sound advice for a tenant on a property owner's side it's still incumbent on the property owner to determine how much power is coming into the building and also be careful on how that power is allocated because if you give too much power to one tenant and you don't leave enough uh for future tenants then you could be in a position where you've either got to upgrade the amperage like we've talked about uh or add a new transformer to increase the the voltage and that can just come with problems on whether the building is even capable of handling it with the conduit and the wiring that's there as well as the service provider being able to to accommodate it so there's more risk i think on the property owner's side if they're not staying on top of it but there's also risk for the tenant because if they find a building that that they thought was compatible or they didn't build in any future requirements for their power they could also be stuck in a position where they have an inadequate power is that fair to say on how i tried to summarize our hour talking in a minute there yeah for sure and also just to remind that this is like dealing with industrial applications which is something different than like residential or with like condos and stuff like that like my answers are tailored more for like industrial facilities so yeah thanks for clarifying that too and that is a good point on that well well bruce you're a fountain of knowledge you're very well spoken on this uh i'd encourage you to do more podcasts too you're a natural at this and you obviously bring a lot of value so i'd encourage you to consider doing more podcasts and i really do appreciate you taking the time to be on here uh beverly has put a few links and on how to connect with you on linkedin and uh bryce i just really wanted to say thank you again for for taking the time to join me on this call so thank you very much for having me i appreciate it okay well let's keep in touch as well all right thanks okay see you guys"

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"VideoID": "1506",

"Title": "Electrical Safety at Construction Work Site",

"URL": "https://www.youtube.com/watch?v=CAm\_8bYxXfQ",

"Keyword": "Electrical safety in construction",

"Transcript": "electrical safety at construction worksites use electricity safely at work sites and avoid injury and hazards use an industrial plug and not a household plug for any handheld tools and electrical equipment in a worksite do not rewire the industrial plug yourself ask your supervisor for assistance do not use a household plug for any of your handheld tools as it is not designed for use in worksite environment an industrial plug is more robust than a household plug-in is suitable for use in worksite environment use a socket outlet assembly soa for your handheld tools at the worksite do not use household socket outlets which are not suitable for worksite environment a socket outlet assembly soa provides industrial socket outlets for easy and safe tapping of electricity supply the built-in electrical protective devices further enhance safety in the use of handheld tools and electrical equipment a residual current circuit breaker rccb is installed to enhance electrical safety do not remove it from the circuit do not remove the rccb from the circuit rccb with tripping sensitivity of 30 milliamperes do not connect your handheld tool or electrical equipment directly to a mobile generator use a socket outlet assembly soa do not tap electricity directly from a mobile generator tap electricity using a socket outlet assembly soa distribution boards db are installed for a specific purpose do not meddle with the wiring tap electricity safely from a db do not meddle with the wiring in a distribution board db tap electricity safely from a distribution board db do not use a multi adapter for your handheld tools it may become overloaded and catch fire do not use a multi-adapter to tap electricity supply use a proper socket outlet assembly soa use industrial plugs and electrical accessories that are in a good and working condition damaged industrial plug or socket outlet should not be use industrial plugs and electrical accessories that are in a good and working condition do not leave long length of cables on the floor hang up the cable with proper support to prevent damage do not leave long trailing cables on the ground cables should be properly supported and secured wiring installed in conduit and properly supported for safety reasons a generator is barricaded and a danger sign board is displayed to prevent unauthorized access do not enter into the barricaded area without permission for your own safety do not enter into the barricaded area mobile generator and the associated earthing system are tested and certified fit for use by an electrical worker licensed by ema the earthing system for a mobile generator is installed for electrical safety do not remove any earthing cable or earth electrode do not use a cable with frail insulation and without an industrial plug do not use a cable with frail insulation check and ensure that your handheld tool power cord and plug are in a good and working condition before you start work portable generators without protective devices and proper earthing system should not be used under any circumstance as an alternate electricity supply source it is dangerous to use a portable generator for any handheld tool with a metallic casing check with your safety officer or the licensed electrical worker for alternate electricity supply"

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"VideoID": "1513",

"Title": "Electrical safety on construction sites, a WorkSafe perspective - Evgeny Zakharov (WorkSafe NZ)",

"URL": "https://www.youtube.com/watch?v=oVuz8372BCY",

"Keyword": "Electrical safety in construction",

"Transcript": "good morning everyone first of all thank you for coming as early to our breakfast um there is nothing really too difficult in here it's electrical safety and the rules are quite simple and the idea for my presentation is to recap I suppose the main points how to keep yourself safe what do we expect is work safe when we visit in sites and what you should do on daily basis so um let's see so electrical safety in this context really when inspectors go around site when we inquire what you're doing on site what your policies and procedures inside we have several really main bullet points here and we have electrical work prescribed direct electrical work which is um Australia New Zealand standard three thousand it's not for your tradies for your general um tradie or any other you know trade on site it's for professional secretions to use the practicable steps that we are looking for on all sides are described by ASN zs3012 and isn't the test3760. they are two great standards uh we're not saying that you must have a copy of each standard this presentation today will lay out few bits and pieces that you need to follow on site and then you shouldn't be concerned with your own safety now we're always saying that we can recommend certain procedures certain controls but if you can think of anything better than that you are welcome to implement it as soon as it's not worse as soon as the controls are effective so let's start with temporary power supply before you start a new construction site before you start demolition side activities you need power on site on probably not with demolition but let's say build inside you bring in electricians they provide you with a temporary power supply for commercial sites it's the one on the left very common for residential sites these two in the middle and on the right now I'm not saying these are correct power supplies will will drill through this later but that's a general overview of how they look like so some requirements and these are basic requirements that we are looking at and you should be aware of so temporary power supply there is a requirement for it to be located at least 1200 male off the ground it's to prevent it to be struck by a mobile plan that is visible that is in a dedicated sport live Parts must be protected it should be suitable to withstand mechanical electrical and thermal stress it should be protected against moisture so that's where IP rating is coming and we'll look at it a bit later all equipment on the switchboard must be identified and it needs to have a certificate of a compliance and a record of inspection now a certificate of compliance and record of inspection are issued by electrical person it's nothing to do with you when you request temporary power supply it's been supplied to you certified and then inspected all right so all routine testing of switchboards it's prescribed the electrical work and must be performed by an electrical worker certified electrical worker so it's just as simple as said now this is one of the examples of temporary points temporary power supply installation on a post off the ground but it's about to fall over this is not a good installation and it's right next to a water tap what can be worse than water and electricity together right once you've got temporary power supply generally what do we tend to do we run a lead we'll have a portable socket Outlet assembly or multi-box as we're calling them whether they are more or less residential or commercial I can't really see it well but doesn't matter there are certain requirements for those two again compliance with Australia New Zealand standard three zero one two we always look at how it's been built if this portable box is not compliant to 3012 we are likely to put a notice on it you cannot use it in construction environment it should it should be constructed out of suitable impact resistant material socket Outlets must be protected by cows or extended sites so minimum degree of protection is ip33 ingress protection is very important that's what determines how hard work in this boarding and just pay attention now plug bosses are not IP rated get rid of them today tomorrow and they never use plug bosses okay that's the most common board that we come across on site and we ask all trades to get rid of them shouldn't should never be allowed on construction site heavy duty shift cord and must be protected by an rcd and a circuit breaker very simple rules nothing complicated if you purchase a ride to in the beginning you will never have troubles all you then have to do is just make sure that you maintain this equipment that you tested that it's still safe for work some photographs yeah um can't really see that these are your generic plug bosses they always rupture the insulation gets damaged very fast um yeah um so let's have a look at chord extension sets now these are probably by dozens in every tradies fan there are some rules there are some rules that you need to follow when you use them it's very simple but very often we find that people just can't make it right so chords must be confined to the story of the switchboard and we're talking here double story buildings maybe more than that commercial half commercial or probably more than single level residential must be confined to the story of The Sweep switchboard except that in lift shafts stairwells and form work okay it should not be used while coiled or reeled you have to uncool them before you use them must not be exposed to Mechanical water or high temperature damage and ideally supported off the ground we've seen examples here Ellen demonstrated a few examples of electrical cords being lifted off the ground hooked perfect so some minimum specs for cables that are not permanently attached and I'm not less than five meters in length so minimum conductor size is probably for most of you you don't really need to know that but just because these are requirements we decided to put them in here conductor size minimum one square meal heavy duty cable must have a nurse conductor which should be colored green or yellow and maximum cable length depends on the rated current conductor size and usage this is tabled in the standard so some incorrect uses that we have come across the cable is off the ground on that left slide but it is pass through a sharp edge and that's still the next thing it gets pulled and you're likely to have it damaged you never Place chords in front of Mobile plans and there's a heavy truck here which is not correct not good and there's another one cable is just above the door opening you close the door shut and you're likely to liven the hole door um a few more examples you get temporary power supply you've got damaged lead you've got another damage extension lead and you guys love repairing them yourselves I know that I mean everyone knows it but be careful when you're doing it there's some work that you can do and some work that you probably shouldn't be doing don't play with electricity so back to safe use of extension sets so damaged cables cannot be repaired with insulation tape every time we come across damaged cables which were taped we will ask you to get rid of them um and as I already said should not build cables must not be laid over sharp edges in places where they can be caught in water and that's very common guys leaving cables in the water in the puddles or in the places where water May accumulate we all have rain in times and if you leave cords on the ground they may get flooded now let's have a look at power tool section power tools is very important this section is important because it's not only about electrical safety well it is about electrical safety but it's about the actual way you use tools as well all right three as and the test 3760 outlines generic safety on what you need to do in your daily inspections routine inspections and when you actually ask in an electrical person or someone who can do test and take for you so there's the whole process there is much more than just testing a lid and put a tag on it the actual point we're looking at Power Tools power tools should be checks for obvious damage defects and modifications before use check that flexible cords are effectively anchored check the damage check there is note that there is no damage to flexible cores check that operating controls are in working order that covers and guards are secured and that ventilation and leads and exhausts are unobstructed all these checks are prescribed by 3760. so it's not just your simple test that and we've got lots of guys from James test and Tech here they will probably be able to tell you firsthand that when you give a number two it's not just a quick process of checking where the conductor is all safe inside insulation but it's all those things together if you get a broken tool if you got a missing guard the tool will never pass a test all right so it's a little bit more to it um and that's a few examples of the tools air compressor damaged insulation as before a drill great tool who cares here damaged insulation a few other examples of exposed wire this is a good one here this just recently I think within the last four weeks in Christchurch uh this is I think 15 amp cable and one of the guys who purchased it because this air is Conductor won't fit in your normal plug he decided to grind it down to feed so it's a completely inappropriate extension set for use in these circumstances unguarded Grinders that's just normal that's it's that's what we see often guys guards missing guards it's part of your testing is part of your taking it's part of your safety right um the most common tools these days are battery power tools but I think there is a bit of a misperception about what battery power tools represent in themselves they have battery packs it's a source of energy and they need to be used correctly so if you look every time you're buying a tool and I'm I used to do building work it's I I had all set of um DeWalt tools and me oh power bet uh battery power tools and I've never opened the manual when I was doing that work and I don't think that you you open those manuals as well but if you open it there will be a few steps that you really need to take to operate them safely so upgrade this manual you need to know that it can't be those tools can't be used near flammable liquids cases or dust broken battery packs can leak chemicals all right batteries May event guess that can explode or this source of ignition they can't be placed near fire or heat they may explode um the big one here charges do not misplace charges only charge those batteries with the charges that were designed to be used with these tools all right and if you need any repairs to be done on them take it to a service center don't attempt to repair battery sales yourself there is an example that's I don't know whether you've seen it before that's how DeWalt battery looks inside just a pack of battery cells and that's what happens when one of them explode or two of them explode it can be bad but generally proper tools not cheap tools that are manufactured in China somewhere very often yeah they come from China they're very cheap proper tools are very heavy duty they are drop protected they're pretty good but you still have to keep a good eye on it it's your investment in the end of the day it's your money it's your tools it's your livelihood it's your income take care of your tools make sure that all electrical stuff guards and everything else are in place and you'll be safe and we will not have problems with you guys when we're going around sites and checking what you're doing and how you're doing it so that's me foreign"

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"VideoID": "1521",

"Title": "Electrical Contact Release Training (Required Annual NFPA 70E Training)",

"URL": "https://www.youtube.com/watch?v=9Q3StjKVms4",

"Keyword": "Electrical safety in construction",

"Transcript": "[Music] [Music] an electrical worker contacts an energized conductor and can't let go a construction worker grasps a damaged extension cord and is unable to release it a shop worker inadvertently touches an exposed wire and her grip contracts involuntarily in each of these instances and in many similar incidents each year people who receive an electric shock are unable to release themselves from contact with an energized conductor or circuit part and without immediate assistance gaining release incidents like these are likely to prove fatal in this program we will explain why this happens and examine the effects of electric current on the human body most importantly we will teach how a victim of electric shock can safely be released from the grip of an energized circuit commonly referred to as contact release learning this critical skill is important for electrical workers their co-workers and any potential first responders this is why the nfpa 70e requires that all workers who may be exposed to electric shock receive annual contact release training as well as those who are responsible for responding to a shock event the nfpa 70e is a safety standard published by the national fire protection association and is widely considered to be the leading authority for electrical safety in the workplace in order for electricity to perform useful work it must travel through a conductor like this one the flow of electricity through a conductor is referred to as electric current and its unit of measure is the ampere commonly called an amp there are a variety of materials that make good conductors aluminum copper steel and other metals make excellent conductors of electricity another good conductor of electricity is water electric current can easily flow through water as well as anything that has become wet or damp this is why we are so vulnerable to being shocked the human body is largely made up of water and can easily become a conductor of"

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"VideoID": "1538",

"Title": "What is a GFCI: Electrical Safety",

"URL": "https://www.youtube.com/watch?v=GgHD8DiMV9g",

"Keyword": "Electrical safety in construction",

"Transcript": "a ground fault circuit interrupter is a safety device that helps protect you against electric shock you'll find gfcis and bathrooms kitchens garages and outdoor Outlets really anywhere that Outlets can be exposed to water they're installed as an outlet or as a circuit breaker in your electrical panel and remember to test your GFC ice and to replace any that aren't working properly be smart and stay safe"

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"VideoID": "1546",

"Title": "Electrical Safety Awareness video #safety #electricalsafety #construction #safetyawareness",

"URL": "https://www.youtube.com/watch?v=7e0ixoDHuII",

"Keyword": "Electrical safety in construction",

"Transcript": "this electrical awareness video is focused on identifying hazards around electricity on the job site all other hazards on the job require the same focus and respect while performing your hazard assessments and should not be disregarded or have any less importance placed on them electricity is all around us it is an essential element in our daily lives nearly everything we do is connected with electricity on the job site working around electricity can be very safe when workers properly identify and mitigate the hazards if hazards are ignored electricity can strike out and its effects can be devastating arc flash arc flash results from two electrical components sustaining an arcing fault if conditions are correct an arc flash will result followed by a blast wave containing molten metal shrapnel and toxic gases no matter the severity any worker exposed to any level of electrical shock or flash must seek medical attention while electricity has the power to seriously harm you the risks of electrical shock can be mitigated and work can be safely carried out without incident electrical safety begins with the proper use of field level hazard assessments and identifying the potential hazards your hazard assessment is the first step in protecting you and everyone else on your job site from any associated hazards which may include electric shock a brief inspection of your job site will help identify other potential electrical hazards while performing your walk-through look listen and smell this will assist you in identifying the hazards on your side [Music] adequate lighting is a must in your work area [Music] if light levels are too low additional lighting must be installed on either a temporary or permanent basis lockout tag out system whenever working directly around electrical equipment the denergizing of equipment is the recommended practice de-energizing equipment removes the potential for electrical shock as power is removed this can be achieved with the proper use of a lockout tag out system while basic procedures may vary from site to site it is essential for you to understand the lockout tag out procedure being used at your job site one thing that does not change from side to side however is that you may never remove another party's lock in a lockout tag out system an effective lockout tag out practice requires a designated employee turn off and disconnect any machinery or equipment from its energy source before doing any required maintenance on the asset this authorized employee should either lock or tag the energy isolating device preventing the unwanted release of hazardous energy additionally the employee should take additional measures to ensure the energy has been isolated effectively [Music] before using any electrical cords or tools always inspect individual items to ensure they are in good working order faulty equipment can lead to personal injury and poses a risk to all those on a job site if items are damaged or are in poor working condition tag the item and take it out of service for repair or replacement fire extinguishers always know the locations of fire extinguishers on your site these should be rated safe for use with electrical fires [Music] [Music] [Music] before work on a construction site begins the person in charge by law must carry out a risk assessment the aim of this is to identify all of the potential electrical hazards and ensure that suitable control measures are in place to prevent them from causing harm to workers depending on the type of work you're doing a hot work or electrical permit may be required always ensure you're in compliance with your site specific policies and procedures regarding permitting controls [Music] always consider overhead hazards in your work area power lines are an ever-present danger due to the possibility of electrical or direct contact and should always be marked high voltage hazards can also be in the ground line locates are required by law before any ground disturbance takes place always call before you dig it is extremely important to recognize equipment in an abnormal condition such as an open electrical panel exposed wiring sparks smoke or fire when you encounter this situation use the look listen and smell approach as this is an immediate cue that extra caution should be used and may indicate a potentially dangerous situation is present water or liquids pose additional risk of electrical shock due to high conductivity the hazard should be removed only after the area is de-energized if you recognize a hazard that you cannot rectify ensure that you ask questions and seek solutions from the appropriate personnel on site do not take it for granted that other workers understand the scope of your work or that there is a potential danger to you or to them [Music] personal protective equipment common ppe requirements on job sites include cotton or fire resistant pants a cotton or fire resistant shirt with a minimum six inch to full length sleeve electric shock resistant or static dissipative footwear type 1 and 2 class e and g protective headwear additional high visibility clothing safety glasses and work gloves for electrical workers that conduct their tasks around energized equipment you should be aware of the standard safety procedures to control the electrical hazards competent workers need to be trained to the systems which will help identify the hazards associated around electrical sources what controls can be best used as well as the additional specialized ppe required such as arc flash clothing arc flash face shield rubber insulated gloves which include leather protectors and more ppe is your last line of defense do not use ppe as a substitute for the opportunity to control or remove existing hazards in the event that all safeguard systems have failed and a co-worker is being shocked never come in direct contact with the worker or you may become entrapped in the shock cycle if possible deactivate the power source and activate your emergency response plan [Applause] working around electricity can be performed safely and without incident by executing sound judgment and diligent observations in order to create your field level hazard assessment and by following the proper safe work procedures you'll be well on your way to completing your task without incident remember the importance of using the proper equipment in good condition and by wearing the proper personal protective equipment by employing all these safeguards not only will you help keep yourself and your co-workers safe you'll help ensure that you'll return safely every day to the people who count on you the most mace considers safety as a very important tool in all work activity at may shower motto is safety first going home safe and well so the individual is of paramount importance [Music] [Music] you"

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"VideoID": "1551",

"Title": "Safety Precautions While Working on Electrical Equipment&#39;s.",

"URL": "https://www.youtube.com/watch?v=CpHbDOHnoKA",

"Keyword": "Electrical safety in construction",

"Transcript": "[Music] safe working procedures tools and instruments safety precautions while working on electrical equipments treat all electrical devices as if they are live or energized disconnect the power source before servicing or repairing electrical equipment as an extra precaution after switching off the breaker the fuses also may be removed use only tools and equipment with non-conducting handles when working on electrical devices never use metallic pencils or rulers or wear rings or metal watch bands when working with electrical equipment wear pay while working on electrical equipment if water or a chemical is spilled onto equipment shut off power at the main switch or circuit breaker and unplug the equipment if an individual comes in contact with a live electrical conductor do not touch the equipment cord or person disconnect the power source from the circuit breaker never handle electrical equipment when hands feet or body are wet or perspiring or when standing on a wet flow when it is necessary to touch electrical equipment for example when checking for overheated motors use the back of the hand thus if accidental shock were to cause muscular contraction you would not freeze to the conductor do not store highly flammable liquids near electrical equipment do not wear loose clothing or ties near electrical equipment"

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{

"VideoID": "1573",

"Title": "Electrical wiring accident #safetyfirst #safetyanimation #animation #construction",

"URL": "https://www.youtube.com/watch?v=HE3khooaT6Q",

"Keyword": "Electrical safety in construction",

"Transcript": "[Music] [Music] [Music] hey hey hey hey hey hey hey a"

},

{

"VideoID": "1580",

"Title": "Electrical Safety-Digging",

"URL": "https://www.youtube.com/watch?v=1y0nDjRH-EM",

"Keyword": "Electrical safety in construction",

"Transcript": "I kind of get a palm and a lift in the mornings,\nso. I'm happy to be alive. It is great. Tom Dickey is one person who really appreciates\nlife. And he doesn't take anything for granted. As a husband, father, and grandfather, his\nfamily means the world to him. And he loves his work as an underground contractor. He has years of experience in horizontal,\ndirectional drilling. The kind of digging that leaves the surface\nintact while creating a tunnel underneath for utilities. He's considered one of the best and has done\ndirectional work in all kinds of settings, even beneath rivers and lakes. Tom places a high priority on safety and with\ngood reason. He knows all too well the dangers that lie\nhidden beneath the ground. At the end of a major project, he was asked\nto do a small additional section before he left. Instead of saying, I can't do it today; I'll\nhave to come back. I took the equipment out there and didn't\nhave my safety equipment. That truck was back down at my shop because\nI'd already moved some of the equipment home. Tom did what many people do. He weighed time and convenience against safety\nand took a chance; one that nearly cost him his life. I'd worked with it enough. I knew that I could just handle this. You just, you never suspect that today is\ngoing to be the day. He did the drilling and then knelt down at\nthe end point, using a shovel to make a final adjustment. He slipped and made contact with 7,200 volts\nof electricity from underground power lines. Everything went into slow motion and as soon\nas I slipped and fell into it, and energized myself up, I felt like I verbally said 'Oh\nmy gosh, Tom, you just killed yourself.' I knew exactly what I was into and I knew\nthat I had made a grievous error. And the next thing I thought of was, uh, was\nthe family and what was my wife going to do without me. What were my kids going to go through and\nwhat were they going to do without me? Within a few seconds, the fuse tripped and\nTom was thrown backward. I started realizing that my hands were over\nmy head and as I drug my hands back over my gloves were on fire because I was wearing\nyellow cotton farmer gloves which you never do, and you know how they can, they had burst\ninto flames. And I had coveralls on and I realized my knees\nwere on fire where the electricity had gone through me and out through my legs. It burnt holes through my coveralls. They were on fire. In excruciating pain, Tom remained conscious\nthroughout. A few minutes later, emergency personnel rushed\nTom to the hospital. The doctor provided a grim prognosis. He asked me if I was religious and of course\nI said, 'Oh yeah, I am. I am.' And he said, 'You know, the next 24, 48 hours\nare going to be critical. It's a good possibility you're not going to\nsurvive.' His wife Bonnie, a teacher, got the call to\nleave school. She picked up daughter Kathleen from high\nschool on the way. As soon as I got there, there was a waiting\nroom and my pastor was waiting and some of my, my sister and people from church, um. Some friends, they were already there. Son Josh, several miles away at his first\nsemester of college raced back. Many others arrived before they were allowed\nto see Tom. He looked like the same Dad I'd always had\nso that kind of put a calm to me, but then when the doctors got into telling us what\nwas going to go on people who get electricity with the voltage that he had don't survive\nand that he's awake and coherent is a blessing. You need to call in the family because he\nmight, he could take a turn for the worse within minutes. They said you're walking around the burn unit\nand you're seeing all these other patients in these other rooms who look really bad because\nthey had been actually burned with fire, you know with some type of fire accident like\nthat. They said that actually Tom is much worse\nbecause his are internal. What you see on these other people is exactly\nwhat their issues are, but you can't see his. His are going to continue to get worse. The hole in my hand was so deep that the bones\nwere showing and it actually burned the tendons off of the tendons snapped back up into my\narm, so to fill that hole in, they had to graft and they couldn't, there was nothing\nin the hole for the grafting to graft to so what they did is they cut a V and pulled it\nup and put my hand there and sewed that V back down over my hand. So that tissue off of my side groin area,\nstill was being fed from my body and then it just started growing. That was really, really tough for him to just\nhave to lay there with his hand attached to him for weeks at a time and he, he asked me\nmost days to just sit and read from the Bible to him. That brought him comfort because he was in\nso much pain. So I would sit there and read to him. The amount of visitors were just unbelievable. They finally just put signs up in the hallway. The family credits their faith and the care\nand support of friends and family with getting them through the many challenges in Tom's\nfight to save his hands and legs. It's not one of those things where you have\na surgery that fixes your limb and it's done with. I just remember that always something else\nwould kind of happen. Never seemed to\nOne step forward and three back Never seemed to be done\nAnd even after I came home, you know, I couldn't bathe myself. You know, for a long time, everyone had to\neverything for you and that's, that's hard to take. I started feeling sorry for myself and I remember\n'Why me, Lord? Why are you doing this to me?' And I dwelled on that for a long time. And finally this voice said to me one time,\n'Tom I didn't do it to you. You did it to yourself. You know, you're lucky you're alive. And that's why he doesn't want anyone to take\nchances when it comes to underground utilities. You know, people have got to understand when\nyou deal with electricity and you do silly things, it changes your life. And it changes the people's lives around you. It's a miracle that I'm still living in the\nhouse I live in and we were able to hold onto the house and that's another thing, you know,\nyou got to realize that something could happen to you, you can't make a living, you can't\npay for what you have, you may lose everything you've got besides, you know, besides limbs\nand fingers and whatever else, besides your life. Working with Safe Electricity's Teach, Learn,\nCare T-L-C campaign, he wants to teach you from his experience. Tom urges everyone to learn how to dig safely,\nto use that information, and care enough to share it with others. Safety starts with calling 8-1-1 to have underground\nutilities marked before digging, whether it's planting a tree, putting in a deck, landscaping,\nor building an addition. The service is free and can help prevent accidents. Even a homeowner that puts a shovel in the\nground in his backyard and gets into his single phase or the electricity coming from the cabinet\nup to his house, if it's in the ground, it can be his last day. And digging into other utilities, such as\nnatural gas lines, can be dangerous and potentially deadly. I have a great renewed respect, for, you know,\nnot only electricity but gas can get you in trouble, different things in the ground. There's a lot of things out there, especially,\na homeowner, a layman, doesn't know about. Never mind a contractor like me that knows. If someone digs into utilities without getting\nthem marked first, they can suffer not only personal injury, but are legally liable for\nutility damage. Plan ahead and call a few days in advance. After utilities are marked, dig at least 18\naway from the marking and always use caution. Tom does a safety walk through at each job\nsite before he sets up his equipment and urges everyone to take time to consider what might\nbe beneath the surface. We've got drainage, sewer, septic systems,\ngas, electrics overhead, and there's no fiber. But telephone and there's possibly cable TV\nout here. So we need to look at 6, 7 or 8 different\nproducts that could be in the ground as we do our walk through. Years later, Tom still lives with pain every\nday. But he won't take anything stronger than over-the-counter\npain medication so he can keep operating heavy equipment. But he is such a strong person. And still to this day, amazes me with the\nstrength that he has, both physically to be still doing this job and I, as well as spiritually\nand emotionally to be able to cope with everything he has and just keep moving forward at all\ntimes. The more I read, the more I see, that people\nhaving the same accidents, I am the only one that I know that hasn't lost limbs. It was a, it was a total miracle. I didn't lose a leg, didn't lose my fingers,\ndidn't lose my arms. I hurt a lot and it's painful. It's inconvenient sometimes to do some of\nthe things I do, but I'm real thankful to be where I'm at. Please. Safety first."

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"VideoID": "1584",

"Title": "Electrical Safety other equipment around utilities | Sims Crane Minute",

"URL": "https://www.youtube.com/watch?v=Oj6VlnDFJpI",

"Keyword": "Electrical safety in construction",

"Transcript": "Hi, I’m Bob Berry, and today we are going\nto talk about how to avoid electrocution injuries when operating equipment around energized\nutilities. Electrocution hazards have consistently caused more fatalities on construction sites\nthan any other type of accident. Jobsite safety begins with an overall awareness of your surroundings\nat all times. It is very important to do a walk-around assessment\nof the jobsite prior to operating any equipment. During a walk-around, always make notes where\npower lines and underground utilities exist and plan your access route accordingly.\nShow proper attention to areas marked with flags or cones indicating hazards may exist\nbelow ground, and use a spotter to communicate when the operator comes into close proximity\nwith hazardous areas. The jobsite controlling entity must properly\nidentify and mark hazards such as underground voids, water and gas pipes and buried power\nlines that may exist in the active work zone. Failure to do so may result in severe injury\nand fatalities to workers near the equipment. In Florida, contractors may call 811 to have\nlocal utilities marked and identified by the utility owners.\nProper clearance from energized utilities should be strictly observed, as current may\ntravel through air containing undetected static electricity to find ground.\nAnd remember… Proper Planning Awareness of Surroundings Good Communication Always makes for a safe lift.\nThanks for watching and sharing our video, and look for another Sims Crane Minute, coming\nsoon!"

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"VideoID": "1587",

"Title": "Basic Electrical Safety for Millwrights | Replace Electrical Plug for Any Equipment Safely ⚠️",

"URL": "https://www.youtube.com/watch?v=rwKVriyekek",

"Keyword": "Electrical safety in construction",

"Transcript": "basic electrical safety formal rights we are going to replace the electrical plug or buy a new plug for a new new equipment first thing what you do is read the nameplate look at the volts and the current the volts here for example is 120 volts and 60 hertz and the current is 6.2 amperes so what you need to do is buy a plug of higher rating than what is there in the nameplate so in this case we bought 15 amperes you can see and 125 volts so this will be safer and it will last many many years without any electrical hazard"

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{

"VideoID": "1593",

"Title": "Safety hack #electrical #funny #safety",

"URL": "https://www.youtube.com/watch?v=b5tKQ9FH7j8",

"Keyword": "Electrical safety in construction",

"Transcript": "another Uncle Joel construction hack when you're breaking into a construction site always keep a magnet handy you're welcome"

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{

"VideoID": "1596",

"Title": "Electrical Safety - Hazard and Risk",

"URL": "https://www.youtube.com/watch?v=I5Te2\_OpVpo",

"Keyword": "Electrical safety in construction",

"Transcript": "[Music]"

},

{

"VideoID": "1605",

"Title": "Evoenergy - Electrical safety inside",

"URL": "https://www.youtube.com/watch?v=z2mzIBpsHm8",

"Keyword": "Electrical safety in construction",

"Transcript": "when we spend more time at home electrical safety is more important than ever so if you get a shock or tingling feeling from your metal appliances sinks or taps you could have an underlying problem and need to report it to evo energy and if you're doing renovations it's important to use a qualified electrician for all electrical work and remember never overload power points or piggyback power boards or double adapters stay alert and stay safe"

},

{

"VideoID": "1618",

"Title": "Electrical Safety Training for First Responders",

"URL": "https://www.youtube.com/watch?v=gDTjx2E7NSw",

"Keyword": "Electrical safety in construction",

"Transcript": "delaware electric cooperative prides itself on providing safe and affordable power to the communities we serve but safety is always our top priority when accidents involving electricity do occur we want to ensure our first responders know exactly what to do and when to contact our utility crews and linemen to aid them in securing the situation in this video we'll discuss the procedures for handling five of the top most common electrical safety situations including pulling meters downed lines equipment and power lines energized transformers and pull fires we hope this information will help you the men and women first on the scene to keep yourselves and your community safe when dealing with electrical accidents it's a common misconception that pulling a meter will de-energize the power lines leading to a home or building that is on fire depending on where the energy source enters the premises the lines can still be hot even after the meter has been pulled energized meters can also cause explosions if not properly de-energized instead of pulling the meter call the co-op to assist you in de-energizing the lines if you feel you must step in we recommend turning off the power at the fuse box flipping the main breaker it happens all the time a car swerves on the road and hits a utility pole and the lines come down in this situation it's important to instruct all passengers to remain inside the vehicle if they step out and make contact with the energized ground we have what's called a difference of potential meaning the possibility of getting electrocuted is high as a first responder create a 50-foot radius around the scene of the accident then call the utility company while your initial instinct may be to charge head-on into the accident to help you could also injure yourself which won't help anyone by contacting the utility company you'll be able to get to the passengers much faster and safer than you could have on your own if the vehicle is on fire and passengers need to escape have them follow these directions in a scenario when there's wires down on the car and the car is on fire this is how you properly exit the vehicle open the door keeping both feet together on the side and bunny hop away from the vehicle make sure when you bunny hop away from the vehicle you do not come in contact with any other part of the vehicle and continue bunny hopping 30 to 50 feet away from the vehicle when you call the co-op to report downed wires or equipment it will be helpful to have the nearest poll number or address many different jobs everything from construction to farming require operating equipment around power lines it's important for employees working in these fields to know where power lines are located in relation to their equipment and how to respond if they ever come into contact with energized lines similar to the procedure we discussed for downlines people operating the equipment in contact with the lines must not get off that equipment the surrounding area could be electrically charged and stepping off or getting out could cause electrical shock immediately contact the utility company to ground and de-energize the lines involved it's extremely important to know your surroundings to prevent these types of accidents from happening transformers are essentially contained power lines just as powerful and possibly just as harmful if a transformer is hit by a car or is on fire the utility company must be called to shut them down otherwise the fire will continue to burn as long as it has an energy source passengers in a car should also be careful they could be in danger just as if they were to make contact with the downed line order passengers and cars near down transformers to stay inside until the utility crew arrives on the scene sometimes utility poles can catch fire this could be due to a controlled burn a house fire or accident pole fires can cause lines to fall and if this goes unnoticed it can cause more damage than the fire itself in some instances these downed lines haven't been located until a few days after the fire event if you don't know the line is there you don't know to be concerned about it and the consequences can be lethal if you see a line down due to a pole fire contact your utility company immediately it is their job to de-energize those lines and to make sure no one who comes into contact with them is injured it is also important to note that water may not put out a pull fire if equipment is still energized as a first responder you must wait for the power to be shut off before attempting to put out the fire there are so many factors when dealing with electricity but knowing when and how to proceed can mean the difference between life and death by having an open line of communication with you and your teams we can ensure safer conditions for everyone involved in electrical accidents when on the scene always remember to evaluate the situation establish a safe perimeter around the scene communicate and contact your utility company when electricity is involved and don't take any unnecessary or uninformed risks while it may be your jobs to keep the community safe we want you to stay safe too stay aware stay informed and stay alive"

},

{

"VideoID": "1630",

"Title": "Electrical Safety: Crane Truck Contact | WorkSafeBC",

"URL": "https://www.youtube.com/watch?v=sBUvYh93pQc",

"Keyword": "Electrical safety in construction",

"Transcript": "Hey, how's it going? Is this the last of the load? Yup, got here as quick as I could. We've been waiting on this. I need you to\nget it up there, all right? OK. What? Yeah I know. Look, I need that stuff\ntomorrow. I'll get right on that... Are you OK?! I can't move the crane! Listen to me. Don't move! That whole area\ncould be energized. What do you mean \"Don't move\"? You're not in any danger if you don't move.\nLook, I'll call the power company right now. When a high voltage power line has been contacted,\nthe ground around the point of contact can be energized for a great distance. If you can't move the machine out of contact,\nand are in no danger, stay put until help arrives. If you are in immediate danger, and have to\nmove, keep your feet together and slowly shuffle at least 10 metres away. Your feet should move no farther than toe\nto heel, never leaving the ground. For more information on working around power\nlines, go to WorkSafeBC.com or BChydro.com/besafe."

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{

"VideoID": "1631",

"Title": "OSHA 30 CONSTRUCTION NAL EXAMQestion and Answer",

"URL": "https://www.youtube.com/watch?v=8--Zv8cRfzQ",

"Keyword": "Electrical safety in construction",

"Transcript": "oscar 30 construction final exam question and answer question osho requires training to be provided within one year of when a safety and health program is first established a true b false answer b false question the minimum safe distance for equipment operating in proximity to energized power lines that contain up to 50 000 volts is a 25 feet b 5 feet c 10 feet d 50 feet c 10 feet question the gfci fits into the standard electrical outlet box to protect ground faults a disposable b receptacle c plastic d none conductive answer be receptacle question some states may have more stringent requirements than federal offshore for working over or near water a true b falls answer a true question load chart ratings will differ when a outriggers are fully extended b outriggers are half extended c no outriggers picking from rubber d all of the above answer d all of the above question the most important a color b cons c degree dgo answer djo question complexity of training depends on which of the following eye size and complexity of the work site b characteristics of the hazards and potential hazards at c the training budget d all of the above e both a and b answer e both a and b question federal offshore requires the employer to initiate and maintain such safety and health programs to ensure a safe and healthful place of employment a never b sometimes c only for governmental agencies d true for all places of employment answer d true for all places of employment question if it cannot fix a serious hazard immediately you should a complain to management b hide it c prevent employee exposure decommunicate the hazard to the crew and subs use signs and bar e both c and d answer e both c and d question gloves used for electrical work must be inspected and tested prior to use and be certified every a 30 days be six months c 12 months d never answer b six months question underground electrical hazards are a easy to identify be difficult to locate exactly and may pose a serious risk to laborers and backhoe operators see always marked exactly where they are located d always buried in red concrete answer be difficult to locate exactly and may pose a serious risk to laborers and backhoe operators question in an effective program management regards worker safety and health as which the following a an overhead expense that is a wasteful part of doing business b a fundamental value of the organization c an important business goal d both b and c e none of the above answer d both b and c question which of the following is necessary training topics for employees a the workplace plan in case of a fire or other emergency b general site hazards and hazards unique to a worker's activity c when and where pp is required d all of the above answer d all of the above question which statement below would be most correct ayosha requires that all employers have written safety and health programs bioshaw encourages employers to clearly document their safety and health programs see written safety and health programs are always required d safety and health training e none of the above answer be osha encourages employers to clearly document their safety and health programs question back disorders strains and sprains carpal tunnel syndrome are examples of what type injury a chemical exposures b musculoskeletal disorders msds see biological hazards d none of the above answer b musculoskeletal disorders msds question successful safety leaders generally possess which of the following a good people and communication skills be worked to gain trust and respect with others see vision and passion d always setting the example as a safety role model e all of the above answer e all of the above question an incident investigation a is good for finding who to blame when an incident occurs b should focus primarily on the behaviors of those who are closest to an incident c should focus primarily on the immediate cause of an injury d will help an employer reduce factors that create unsafe conditions answer d will help an employer reduce factors that create unsafe conditions question training topics for employees who are exposed to fall hazards should include or roof all hazards that may be encountered be full protection standards and requirements see procedures for erecting maintaining disassembling inspecting fail and using d processes for reporting problems or obtaining guidance on full protection issues e all of the above answer e all of the above question hand arm vibration hav can a result from using handheld power tools because carpal tunnel syndrome in the fingers and hands see result in the loss of sense of touch d all of the above answer d all of the above question an annual inspection of each crane a is required by offshore b must be documented c is typically kept with the crane d all of the above answer d all of the above question the means by which workers develop and or express their own commitment to safety and health protection is an exam a management commitment b employee involvement c worksite analysis d none of the above answer b employee involvement question osho has long recognized that the implementation of a safety and health program is a way of i saving on the need for additional compliance officers be not having to comply with oshawa's most rigorous requirements see demonstrating good faith by an employer with respect to safety and health d all of the above answer see demonstrating good faith by an employer with respect to safety and health question an important feature of a hot work permit includes which of the following a an inspection of the area and isolation of combustibles and flammable materials the establishment of trained fire watches see standby employee with portable fire extinguishing equipment d written authorizations to conduct the work e all of the above answer b establishment of trained fire watches question which of the following is allowed for accessing a scaffold a ladder b stair tower c ramp and walkway d all the above answer d all the above question hazard prevention and control includes which of the following a elimination and control workplace hazards the establishment of a preventive maintenance program see training and information for employees derecord and analyze occupational injuries and illnesses e all the above answer e all the above question spoil piles should be backed off from the side of a trench by a minimum distance of a not less than one foot be not less than two feet c not less than six feet d none of the above answer be not less than two feet question a safety and health program should be a consistent with standard industry-wide programs be personalized and tailored to the specific job hazards at a workplace see written in a way so that it will never need to be changed d written so that it can be used by all facilities of and single organization answer be personalized and tailored to the specific job hazards at a workplace question supervisors should receive specific training in leadership skills such as a hierarchy of controls b being in charge c communication and coaching d taking and receiving answer see communication and coaching question a must be available to direct workers who are constructing or moving scaffolds a qualified inspector be osha c supervisor decompetent person answer decompetent person question a hazard is defined as a situation or condition that has the potential to cause harm to a life b health c profits d schedule e both a and b answer e both a and b question once completely erected the jacking mass tower crane must be retested a true b falls answer a true question the top section of an extension on a straight ladder should a be used by itself b not be used by itself c never be used at all d none of the above answer b not be used by itself question when a circular saw is withdrawn from the work material the lower guard must automatically return to the covering position a true b falls answer a true question lift s lab operations lifts lab operations must be designed and planned by a a registered professional engineer experienced in lift slab construction be qualified person c superintendent for the operation deosha inspector answer a a registered professional engineer experienced in lift slab construction question concrete buckets equipped with hydraulic or pneumatic gates shall have a positive safety latches or similar safety devices b plate to indicate date of design see all of the above d none of the above answer a positive safety latches or similar safety devices question when the employer receives an offshore citation it must be a contested and filed with the courts be copied and mailed to each worker see posted for three days or until the violation is fixed designed and returned to offshore answer see posted for three days or until the violation is fixed"

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{

"VideoID": "1649",

"Title": "Beware of major electrical hazard!",

"URL": "https://www.youtube.com/watch?v=5uHYX9st-ZY",

"Keyword": "Electrical safety in construction",

"Transcript": "So here we have a classic example of some \nimproper wiring, main feed wires coming   from the house. Let me flip the camera \naround, maybe not. So we look up here,   this is classic, it's just literally right \nat hand height, totally exposed live wires,   right into the house that you can \ntotally touch. 100 amp service. NO."

},

{

"VideoID": "1651",

"Title": "How to safely work on electrical in the rain?",

"URL": "https://www.youtube.com/watch?v=8X4hc0FiPo8",

"Keyword": "Electrical safety in construction",

"Transcript": "hey potential engineer here i know you didn't ask but i'm not sure this is safe with all the rain and lightning now i'm not you know qualified electrician i'm a mechanical engineer it just doesn't seem like a solid idea luckily though they brought another crane up so they have redundancy concerning safety mitigation so you can sip on that"

},

{

"VideoID": "1676",

"Title": "#electrical #safetyfirst #electricalhacks #diy #diycrafts",

"URL": "https://www.youtube.com/watch?v=AXgoC6xgKyk",

"Keyword": "Electrical safety in construction",

"Transcript": "[Music] bring the drink [Music] [Applause] [Music]"

},

{

"VideoID": "1697",

"Title": "Electrical safety first #shorts",

"URL": "https://www.youtube.com/watch?v=q416f86TPKg",

"Keyword": "Electrical safety in construction",

"Transcript": "[Music] you"

},

{

"VideoID": "1701",

"Title": "Commercial Electrician#shorts⚡DON&#39;T DO THIS !!! #bad electrical installations#electrical hazard",

"URL": "https://www.youtube.com/watch?v=R\_skEoWXwVw",

"Keyword": "Electrical safety in construction",

"Transcript": "how's it going everybody it's electrician on \na mission so i'm fixing this wall behind a   couple guys i just want to see something here if \nanybody can let me know what's wrong with that box   let me know in the comments all right so long \nstory short if you need to put the box right there   and the device needs to go there just grab a piece \nof channel a piece of stud cut it proper length   mount your box to it and then overlap the \nstud screw it down and there you have it okay   this is going to cause a problem \nscrews will go right through it   everybody have a good day make \nsure all your stuff is level"

},

{

"VideoID": "1708",

"Title": "Bend Conduit With Heat! #electrician #conduit #conduitbending #hustle #money #sidehustle #electrical",

"URL": "https://www.youtube.com/watch?v=gUVbLToS2hE",

"Keyword": "Electrical safety in construction",

"Transcript": "don't fall for this common customer scam recently I had a job pressure washing a house for a customer before I began pressure washing I offered to give the customer a price on cleaning their driveway as well the customer politely refused and said that they just wanted their house pressure wash so I gave them a price and they agreed and I came back the next day to begin working while I was pressure washing the house the customer told me that if I pressure wash their driveway they would refer me to all of their friends and family and I would get a lot of work"

},

{

"VideoID": "1721",

"Title": "How to stay safe when working Electrical⚡️😂😂#trending #electrician #shorts #comedy",

"URL": "https://www.youtube.com/watch?v=1ie2HvOAr0k",

"Keyword": "Electrical safety in construction",

"Transcript": "guys so when you install an outlet you gotta make sure that you install it live when you installed it live it's better that way you won't get socked because you know when the power goes on when you install it live so when you install the outlet make sure to install a lot oh and another way to stay safe you never want to use electrical tape when you finish with an outlet just leave it exposed for the next guy who comes to work on it it makes it easier so he doesn't have to take the tape off tape is for man make it easier all right guys so when you swipe in a box you want to always make sure so you don't get shocked make sure don't put the ground on all right and then make sure you strike so it goes hot and then neutral right you're gonna put the hot on first and then you put the neutral you don't have to put the ground on that shit's just for sure see see the wire right here you want the wires to be in the order and make sure you when you work know anything you want your hands to get wet too and work on a live wire that's how you"

},

{

"VideoID": "1757",

"Title": "Electrical Fault Finding Glasgow",

"URL": "https://www.youtube.com/watch?v=im-Y4HPSAxQ",

"Keyword": "Electrical safety in construction",

"Transcript": "[Music] do [Music] [Music] you"

},

{

"VideoID": "1766",

"Title": "Non Maintained Emergency Light Installation. #electrical #escape #emergencylight",

"URL": "https://www.youtube.com/watch?v=gKkjTbPQcVo",

"Keyword": "Electrical safety in construction",

"Transcript": "foreign [Music] foreign [Music] [Music]"

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"VideoID": "1820",

"Title": "Electrical Safety Videos",

"URL": "https://www.youtube.com/watch?v=vrAZII\_LSSU",

"Keyword": "Electrical safety in construction",

"Transcript": "exposure to energized electrical wires is the most common and probably the most dangerous electricity related situation emergency responders can face when you encounter any downed wires including telephone and cable television wires always assume the line is energized until it is identified or proven D energized by a qualified Edison person if you are first on the scene of a downed or sagging wire incident park away from overhead wires and stay in your vehicle until you have carefully examined the incident area it is impossible to determine if a wire is energized by its appearance while some wires will jump whip-around curl up make loud sounds or emit showers of sparks others will lie there silently disconnected wires may be live but not arcing also automatic switching equipment far away from the scene can re-energize wires without notice do not attempt to move down wires on all down wire incidents call Edison and set up a safety perimeter at least 30 feet away from the wire continue to secure the scene until an Edison employee or other authorized person arrives to eliminate the electrical hazard it is important to visualize the flow of electricity from pole to ground at night use a light to trace all conductors from pole to pole until you've determined the full extent of the damage and the location of all the downed wires be extremely careful in high vegetation areas where wires can be camouflaged or hidden especially at night as you track the wires path locate all wire ends and stay clear always be on the alert for conductive materials that may be in contact with the Fallen wire this includes metal fences guardrails signposts sheds and other metal structures a metal fence for example can conduct electricity anywhere along its length which could be a considerable distance from the wire if a downed or sagging wire is touching a vehicle fence pool of water or other conductive element that element is as dangerous as the wire it's remember that even wood can be a conductor when wet or dirty touch potential occurs when a person creates a current path to ground by touching and energized object here's a rule you should never forget never touch wires equipment or objects that may be energized if you are holding a low voltage wire that suddenly becomes energized your muscles could be restricted in a vice grip once your heart muscle is paralyzed the effects of low voltage contact are the same as high voltage contact 10% of the voltage it takes to light a 100 watt light bulb with typical household current is enough to cause serious injury or death my body immediately went into a full contraction every muscle in the body immediately contracts it's the most excruciating pain I've ever had and that basically was you know receiving the shock emergencies involving underground manholes or vaults are high-risk situations for first responders even if the appearance above-ground is benign if flammable gases are present in the manhole removing the cover could provide enough oxygen or sparking to cause an explosion if gases are present in the cable ducts that run from manhole to manhole there could be additional explosions in adjacent manholes if an underground transformer in the vault has failed and the oil is above the ignition temperature it could explode without notice in the underground environment one failure in the system has the capacity to cause additional equipment or cable failures the resulting explosions could seriously harm you and others nearby here's what to do call edison give the location the vault or vent pipe identification number number of manholes involved and the nature of the emergency establish a safety zone keep the public away and route traffic around the area don't park vehicles near vault or main hole covers or vents if the cover is in place and smoke is coming from the holes in the cover do not attempt to remove it until the conditions have been thoroughly discussed with a qualified Edison representative never spray water or foam into an underground structure even if a fire is visible unless the structure has been de-energized large switches transformers and other electrical equipment reside in pad mounted structures usually installed near the street in residential and commercial neighborhoods when responding to an incident involving a pad mounted structure here's what to do assume that the structure and anything touching it is energized and do not approach the pad mounted equipment call Edison and give the operator the street address and any equipment number you can see on the pad mounted unit involved never attempt to open the doors remember step and touch potential if fire is involved treat the situation as you would any Class C fire protect exposures and wait for Edison to de-energize the equipment before fighting the fire or attempting a rescue you your first task on a pole fire is to identify the problem because your response depends on what is on fire and where the fire is on the pole most fires at the top of the pole are pull top equipment fires involving a transformer capacitor insulator switch automatic switch or other apparatus attached to the pole consider these energized electrical fires as Class C do not spray water foam or gel onto any pull top equipment or fires at the top of a pole call Edison and wait for a qualified utility worker to arrive generally fires at the base of the pole are common class a combustible fires that should be contained if it is evident that the fire at the base of the pole was caused by ground fire you can put it out however if ground fire does not appear to be the cause be aware that the problem could be caused by underground electrical conditions or a downed wire contact Edison to de-energize the location before doing anything more set up a safety perimeter at least 30 feet away from the pole and continue to secure the scene in cases where fire has created the possibility of a pole falling on a structure consult your departmental policy on how to act if the policy is to contain the fire use a fog pattern as your response when you arrive at the scene of a structure fire locate the power sources and the electrical equipment you could come into contact with them be careful not to stage units under overhead wires communicate those potential dangers with your co-workers then contact edison according to your department's policy one of your first tasks should be to disconnect the utilities within the structure by opening the main circuit breaker at the panel if the main circuit breaker won't open open all of the individual circuit breakers if the panel cannot be utilized the power supply to the structure should be interrupted this should only be done by Edison when working outside stay clear of metal gutters and other materials that conduct electricity never prop ladders on or near anything that could come in contact with energized wires never use metallic ladders near any energized equipment even wooden ladders can conduct electricity if they aren't completely clean and dry stay away from service drops or weather hits be aware that some structures may have more than one service drop and each service drop and weather head can vary in design most electric wires are not insulated although they may appear to be because of a protective coating we recommend that you'd never cut any electrical conductor cutting wires exposes you to potential electric contact or flashes which can cause serious even fatal injuries [Music] if you feel it is necessary to de-energize an electrical conductor immediately call edison for assistance while it may seem obvious never pull an electric meter to de-energize a structure meters are not switches they could explode vehicle hit polls are a relatively common occurrence an electrical danger is not always evident so when you first arrive at the scene notify Edison through your normal communication procedure of the exact street address or the closest street address this will enable Edison to expedite a response to the incident set up a safety perimeter at least 30 feet away to restrict access and protect the public and avoid staging under overhead wires never attempt to move down powerlines if people are inside the vehicle with a wire down but there is no fire and no one is injured the safest place for them is inside the vehicle until the line has been de-energized from a distance instruct them to stay in the car until the energized wire can be removed by a qualified person if the victim is conscious and there is a vehicle fire or other immediate threat fight the urge to approach the vehicle you could move into the electrically charged area from a distance establish contact with the victim and instruct him or her to stay put and listen tell you to because you can't be electrocuted well 51 yea Edison respond what I'm gonna do sir is have you jump out of the car but don't do anything until I tell you to okay I'm gonna have you open the door I'm gonna get you to step on the door ledge okay go ahead and open the door right now okay go ahead and step up on the door ledge and don't do anything more you're gonna have to jump out of the car don't do it at this time you have to land with both feet on the ground at the same time okay jump away from the car go ahead and do that now instruct the victim that he must jump clear and avoid touching the vehicle in the ground at the same time if he touches the energized vehicle while his feet are on the ground he becomes a path to ground when electricity enters the ground it radiates out in concentric circles or rings like the ripples in water when a pebble is dropped in each ring has a different voltage dropping off from the center to the outer edges if you step one foot on one ring and the other foot on another ring you're stepping on two different voltages that the electricity has to bridge that gap between your steps is called step potential the same thing is true if you jump out and lose your balance causing your feet to land on one ring in your hand on another eliminate the gap and you eliminate the need for electricity to travel through your body walk in a shuffling motion at least 30 feet away from the source of electricity if the victim is unconscious with a vehicle fire or imminent threat the victim must not be removed from the vehicle until the wire is cleared away and secured by a qualified electrical worker if you follow your natural impulse and attempt to remove the wire you could easily become the next casualty Edison strongly discourages moving wires under any circumstances however exceptional situations may arise in which your first response team feels that action is imperative in that case your department policy should instruct you on how to act only you can determine the urgency of the situation wildland fires can occur in many parts of this region the most important thing to remember is to maintain a safe distance from the power lines one and a half times the height of the power line structure restrict public access outside that safe approach area do not consider cleared areas around Edison towers or poles as a safe haven during a wildland fire just because they are relatively free from vegetation look out for power lines in and around the fire area during suppression operations crews involved in fire line construction or extending hose lines need to be aware of the dangers of working under or near power lines direct flame impingement smoke contaminants fire retardant foam or water can conduct electricity directly to ground or across insulators to ground through the pole or tower these conditions can cause power lines to arc similar to a lightning strike and just as dangerous remember to treat all downed wires as if they were energized downed wires can energize fences equipment phone lines cable lines and any other conductive material wood or metal communicate with your crews tell them the location of all power lines that are or could be involved in the incident communicate with Edison to report any damage or potential damage to power lines and give an exact location for the Edison crews who will respond in for medicine of any back fires or aerial drops that are planned around power lines Edison will provide a representative to assist in identifying potential hazards avoid identifying escape routes that would take personnel under or near power lines choose a safe escape route away from power lines because of the risk of arcing caused by fire and smoke safety zones must not be located under or near power lines fire shelter material is conductive and may attract an arc if a power line faults to ground the same rule applies to the incident command post do not locate the ICP or Park equipment under power lines aircraft should avoid all powerlines in and around the incident pilots should never fly lower than the power line Tower or structure aircraft should stay away from the powerlines when making drops on fires aerial drops of fire retardant foam or water can damage insulators and create a conductive path to ground through a pole or tower these agents can also provide a conductive path between wires causing a fault or arc that may cause damage and lead to wire down hazards extinguish pole fires in wildland fire areas as soon as they are discovered burning or smoldering poles left behind in a burn area can eventually end up as wire down hazards for fire fighters all responders should take special precautions to avoid downed wires after a wildland fire"

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"VideoID": "1849",

"Title": "Crack the Code: Mastering the NEC Electrical Code in 5 Minutes!",

"URL": "https://www.youtube.com/watch?v=JnkK\_yVQkaU",

"Keyword": "Electrical code compliance",

"Transcript": "hello out there uh hello again it's lenny your starving electrician oh yeah um what we're gonna start doing or what i'm gonna start doing is uh posting uh shorter videos of uh code questions how to look up things in the code book they're going to be random but these are things that i found on the when i went for my uh master's prep course and then my journeyman's prep course um it was really informative class and then the it was um it was the same technique to looking up things with for the journeyman's and the masters it's very simple but i'm going to go over a bunch of these different questions i'm going to show you how to look them up and to make it easier for you not just to get like a journalist card but to um if you have a code question about maybe something in your house you know this is a course for the beginners of course or not a course but my channel is for the beginner so if you have any questions i get a lot of questions about code and whatnot i can only give you what's in the code book i can't tell you um your local municipality and certain things like that so um just so i don't lead you astray i'm gonna show you how to look up for yourself okay so uh here we go let's get started okay here comes the first question that in the study guide what i had and it is round boxes blank where conduits or connectors require the use of lock nuts or bushings are to be connected to the side of the box so shall be used shall not be used shall be listed shall be approved well the first technique is let's look for round boxes that's the question and in the body of the answer or what we look up we're gonna look and uh skim through and see if any shall be shall not be shall be listed shall be approved coincide with round boxes conduits and connectors so there's a little technique to it but i'm going to show you how that works now here let's go to the code book okay first thing we do is we go to the back of the code book flip all the way to the back you have an index just like you would a dictionary alphabetical order there's b we look for boxes alphabetical order alphabetical order let's see so we come here to the top of this page we're getting warmer bonding bonding bonding holes bowling alleys boxes hey what do you know what type device pool and junction sorry about the focusing accessibility um concealed work conductors number in a box entering boxes conduit bodies looks like we're at somewhere around article 314. so now i'll show you let's go to article 314. the code book isn't based on pages they're based on articles um so it's it believe it or not it is an easier way to look this up so okay so we found boxes we're around 314 we didn't see anything like steel boxes or conduits but some of those key words were still in there so okay so we're going to go over to article 314. so let's think okay if you're flipping through the articles they're just like the pages three let's see article 312. look around let's see all right look around 312. the next page oh no it skips from 312 goes to 314 okay so it must be in the middle scan down look around because your articles change they go up and down not left to right so we scan scan scan we knew we're in the middle oh article 314. just what it said yeah my outlet devices pull junction boxes okay we were looking for round boxes whether they shall shall not um where conductors are connecting requiring the use of lock nuts sculpt the arctic hull huh okay sheet metal non-metallic okay oh look at that we found round boxes round boxes shall not be used where conduits or connection requiring the use of lock nuts or bushings are to be connected to the side of the box so the answer is that shall not be we go back up to where we were round boxes shall not be used where conduits or connectors requiring these lock nuts or bushings are to be connected to the side of the box so there's your answer it uh it's pretty easy it's just a matter of i'm gonna go over a bunch of these articles and they're just gonna get easier and easier but that's how you look them up they give you plenty of time on the journeyman's exam but you look up boxes and then find the article you get close enough scan the article then it's it tells you round boxes okay great all right then we if we scan our keywords shall be shall be not used then we can find them like that but that's your first uh lesson in looking up code book answers easy enough go"

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"VideoID": "1851",

"Title": "Stay in Electrical Code Compliance – Captain Code Is Here to Help",

"URL": "https://www.youtube.com/watch?v=kfbcTIyKSuI",

"Keyword": "Electrical code compliance",

"Transcript": "looking to stay on top of the national electrical code get leiton's captain code 2023 with the latest information on requirements and product solutions to ensure compliance learn more at leviton.com Captain code hi I'm Tom Dean channel manager at 11 to manufacturing I'm here today to talk about our captain code program and the national electrical code the NC has revised every three years and remodelers installers and contractors need to know the changes from one code cycle to the next that's where Captain code comes in our content is licensed by the National Fire prote Protection Association and we have code Scholars doing the analysis trying to make this simple for installers and rebers to understand think of it as a cliff notes for the cap for the national electrial code we even translated this cont into Spanish for Spanish-speaking installers to give you an idea of what is in the 2023 National Electric Code the changes we've identifi the top five co- changes for 2023 number five surge protection in 2020 we saw search protection required throughout the home in 2023 they've expanded that to uh dormitories fire stations and assisted living facilities check out the captain code for all granular details number four it seems that every code cite include changes to gfcis and residential kitchens 2023 no exception there's some changes uh not just limited to countertops but throughout the kitchen once again check out the captain code guide for the granula details on that staying on residential kitchens for a moment number three is uh we're talking about islands and peninsulas seems to be all the rage in remodeling today is adding an island or Peninsula and receptacles in that initially they wanted at least one and it was a c calculation according to counter space size or or Island size you had to have a different number of receptical 2023 they've struck everything you don't have to have a uh receptacle for safety reasons I won't get into the granula details but check out the captain code guide for all the details on requirements for Islands number two electric vehicles electric vehicles are real hot right now uh Captain code covers electric vehicle Supply equipment the different uh requirements for sizing the circuits uh you want to sh out the captain code guy for getting all the details on that okay let's get to the number one change for the 2023 Nation electrical code and that is the allowance of 10 amp circuits and copper clad aluminum wire they added references to 10 circuits and Coptic aluminum wire throughout the NEC with the apparent intention of allowing for these the use of this to save money on circuits like lighting uh there are some very serious caveats I wouldn't go installing this yet you really need to read the captain code content uh because it's really not allowable at this time perhaps the 2026 code there might be some additional language that'll allow it but uh once again get the captain code guide so you can see that there's a lot of value to this Captain code program uh you can get it in printed version at your Levon distributor locations or our online portal at lon.com Captain code or on our free app wherever you get your apps lastly all of our Levon contractor face programs can be found at left.com contractor connect so bye for now thanks for listening are you an electrical professional looking to stay on top of the national electrical code then look no further than leviton's Captain code 2023 our newest edition gives you the latest information on electrical code requirements and product solutions to ensure compliance and safe practices leviton's Captain code 2023 is designed to help you easily search and find the information need on your computer smartphone or tablet don't get left behind keep up to date with leviton's Captain code 2023 learn more at leviton.com Captain code"

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"VideoID": "1852",

"Title": "Attic Wiring Unraveled: Expert Insights on Electrical Code Compliance near attic entries ep:1",

"URL": "https://www.youtube.com/watch?v=\_KqsZdd6w\_4",

"Keyword": "Electrical code compliance",

"Transcript": "here's one here the Romex is practically coming out of the attic this is crazy don't do this this is dangerous in every way and completely not acceptable per the NEC or just common sense standards let's talk about how to install Romex next to an attic access or an attic Scuttle hole recently I had to fail somebody because they had Romex too close and I actually had a hard time finding the code I knew as far as what it said but I didn't know exactly where it was to my surprise I actually did not find it in the Romex section I found it in the AC cable section if you go to 334 which is Romex it actually refers you back to 320 which is AC cable AC cable is very similar to This MC stuff here behind me it's armor cable if we look in accessible addicts tells you how to install it we'll run across the top of floor joists or within seven feet of the floor or joists across the face of the rafters or studying the cable shot be protected by guard strips that are at least as high as the cable where the space is not accessible by permanent stairs or ladders protection should only be required within six feet of the nearest edge of the skoda hole or attic entrance then it goes on to say if it's installed on the side of parallel Rafters or studs it needs to be installed per 300 1.4 which is protection for physical damage that would apply if you had like a elevation change in your attic and like stairs and you're running Romex across the face of that and you could possibly kick it with your toe that would be subject to physical damage and you would have to uh act accordingly with how you're going to protect that so we're going to talk about running across the top of floor joists specifically because that's what the scenario was and then also before we get into it just know that you cannot put Romex on top of attic decking so if it's decked with plywood whatever Romex cannot go there that storage space for the homeowner don't do it even if it's underneath the AC unit or something um just just don't do it you can't do it so if you look here you're going to see that the Romex is very close to the attic access and specifically what we said earlier if it's a permanent attic access you can see the Springs there you're going to know that it's got to be seven feet away so seven feet in all directions if you've got decking on one side and Raptors on the other that's going to apply to the Raptor side of course and then the decking no room mix whatsoever so one option would be to just I've seen it where people put two by fours over all the rafters and they just deck the whole thing as long as we're not pinching the Romex that's also cool now if you got a attic Scuttle hole where you don't have a permanent access it's still six feet so we got seven feet for permanent and six feet for a Scuttle hole so we're gonna look at what a furring strip might look like what a parallel framing member might look like and some other examples to help you get your installs up to code here's a good example of a running board or a furring strip you can see that this 1x4 is definitely higher than the Romex itself and you got adequate protection because if you're to stand on this you're not going to be crushing the romech here's one here the Romex is practically coming out of the attic this is crazy don't do this this is completely not acceptable per the NEC or just common sense standards this one here they got the Romex on the plywood decking now I've drawn this real mixing myself in paint but you guys can get the idea if you have raw mix on the deck since we cannot do it here's what I'm going across the step and how you'd want to put that framing member maybe across the face of that so you can't kick it maybe cap it off so that code reference is 320.23 a and that says cables run across the top of floor joists if you found any of this helpful let me know what you think in the comments below and also like And subscribe thanks for watching see you guys in the next one"

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"VideoID": "1853",

"Title": "Electrical Code Compliance in Des Moines Iowa - Ensuring Safety and Quality | (515) 822-8132",

"URL": "https://www.youtube.com/watch?v=ZhM4EYnESrw",

"Keyword": "Electrical code compliance",

"Transcript": "electrical code compliance in Des Moines Iowa ensuring safety and quality adhering to electrical codes and regulations is not just a legal requirement but a fundamental step in protecting lives and property our team of knowledgeable electricians is well versed in the latest Electrical Codes we will ensure that all installations and repairs meet the necessary standards [Music] foreign"

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"VideoID": "1859",

"Title": "Electrical Safety &amp; Compliance Service",

"URL": "https://www.youtube.com/watch?v=ktOAtCn6gIw",

"Keyword": "Electrical code compliance",

"Transcript": "[Music] at detector inspector we work with real estate agents to make homes safer for tenants and compliance simpler for landlords did you know electrical appliances need to be serviced at least every two years to ensure the safety of occupants according to energy safe victoria electrical incidents injure or kill more than 800 victorians every year with approximately 75 involving children at home and yet our data reveals that around 1 in every 10 rental properties has a critical safety issue with its electrical service when we first visit them putting tenants lives at risk detector inspectors comprehensive biennial electrical service and safety check ensures that tenants are safe and landlords are compliant as one of australia's largest to most experienced residential safety and compliance service providers our trained technicians visit hundreds of thousands of homes each year all over the country ensuring safer homes carried out by one of our qualified electricians the electrical service and safety check usually takes one to two hours to complete and typically includes a thorough switchboard inspection including a condition and safety check insulation resistance test and rcd safety switch test earth loop and polarity tests of all accessible power points a thorough inspection of all landlord-provided electrical appliances checking for damage to plugs leads and casings and replacement of faulty or damaged safety switches light switches power points fuses and circuit breakers and a full seven point safety check of each electrical appliance including a comprehensive compliance check of the property against the australian standards call detector inspector today on 1300 134 563 to request our electrical service and safety check detector inspector we make safer homes"

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"VideoID": "1867",

"Title": "Importance of Grounding | Electrical Code Compliance Lindale, TX",

"URL": "https://www.youtube.com/watch?v=x77lpLOrurM",

"Keyword": "Electrical code compliance",

"Transcript": "[Music] hi I'm Randall with Mr Sparky of Tyler crowning is very important to the electrical health of your home or business but is often overlooked having a ground rod or two helps to avert high voltage surges into the ground and away from appliances TVs and computers this prevents potential damage or electrical shock grounding rods are very important in areas where frequent lightning strikes or in workshops with lots of electrical equipment is used Mr Spark Tyler will help make your home the safest it can be we'll check for signs of faulty grounding system and always install the highest quality of copper rods"

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"VideoID": "1869",

"Title": "Bathroom Electrical Wiring Requirements in the 2023 NEC",

"URL": "https://www.youtube.com/watch?v=1-D\_B9c7Dmw",

"Keyword": "Electrical code compliance",

"Transcript": "hi welcome to the NFPA link YouTube channel this page is dedicated to answering any question or challenge you have related to electrical and life safety and we're going to use NFPA link to do it easy to use digital access to NFPA codes and standards today we've been asked to cover the important points of bathroom electrical wiring using the 2023 National electrical code let's get started so from the desktop and Link I'm going to navigate to the 2023 National electrical code and now we know we want to deal with bathrooms so I want to use the search feature and link to just search up the term bathroom and as we look at this we can see that the bullet point over here shows that we're searching the 2023 uh NFPA 70 which is the national electrical code and the term bathroom throughout the code pops up here and what I want to look at first is the definition of bathroom so if we go to the definition of bathroom in article 100 it's defined as an area including a sink with one or more of the following so the the base level it needs to have a sink in it and then it has to have one or more of the following either a toilet a urinal a tub a shelf hour a bedet or similar Plumbing fixtures so that's what's what's going to be defined based on the national electrical code as a bathroom if we go back to the search section you can see that now it's selected with the bullet point over here it's selected just within article 100 so to go back and grab those other sections I want to grab all of NFPA 70 2023 and we'll see that we have all the sections that were there before so so just looking through this search area we get a lot of information about bathrooms so first of all we had the definition that we just went through then moving on we have in 23070 A2 the service disconnecting means shall not be installed in the bathroom so the overall main disconnect for the home uh cannot be installed in the bathroom so that means an electrical panel is not going to be installed in the bathroom and we'll follow that up here in this next section that says uh 24024 e says overcurrent protective devices other than supplementary overcurrent protection shall not be installed in bathrooms showering facilities or locker rooms with showering facilities so when we start getting into commercial applications where we have locker rooms maybe in a gym the locker room that has showers uh within it you cannot have uh electrical panels or over current devices of any type circuit breakers things of that nature in those areas um 550 goes into Mobile and manufactured home specifics uh for bathrooms um but 21052 D gives us a base rule um and it says that at least one receptical Outlet must be installed in bathrooms within 3 feet of the outside edge of each s 2101 C3 moves into bathroom Branch circuits so where the 20 amp uh circuit supplies a single bathroom outlets for other equipment within the same bathroom shall be permitted to be supplied in accordance with 21023 B1 and two so I want to jump into that section real quick to take a look at a little more of the information that they're giving us there and as we navigate over to that section we're dealing specifically in this case with dwelling units so when we're talking dwelling unit bathrooms in addition to the number of Branch circuits required by other parts of this section one or more 20 amp branch circuit shall be provided to supply bathroom receptical Outlets required by 210 52d so we looked at that 210 52d that's where it said we had to have at least one receptacle within 3 ft of the outside edge of the SN Basin um so with that this is stating that we have to have a 20 amp branch circuit to supply that outlet okay such circuits shall have no other outlets however what we were just looking at in the search section is this exception so the exception reads where the 20 amp circuit supplies a single bathroom outlets for other equipment within the same bathroom shall be permitted to be supplied in accordance with 2102 23 B1 and B2 okay so that 20 amp circuit if it's just feeding one single bathroom uh you have some options to install some other items on it as long as it's within accordance with 21023 B1 and B2 um so B1 gives you some information about uh not exceeding 80% of the the branch circuit rating um so another uh good thing we can um do in link here is use direct to see what we have uh as far as bathroom requirements so if we go over here to direct and select we've got two different bathrooms here so we've got a residential bathroom and we've got some different uh hotspots located around here so we've got a light fixture here that's one looks like a a bath exhaust fan for two a vanity light for uh six five is plugs four is appears to be a jacuzzi tub and then then three looks like it's a thermostat maybe for this tile heat here um so there's quite a few requirements in here um that go into and for example here's the uh branch circuit requirements that we were just discussing in 21011 C3 we've got one or more 20 amp Branch circuits should be required um one branch circuit is permitted to supply all bathroom receptacles within the residence but in the case it must not serve any other load so if we've got uh that one circuit we're talking about and we've got a say a bathroom on the first floor and a bathroom on the second floor and we're going to use that one 12 amp branch circuit to feed both of those uh bathroom Outlets that's fine uh but in that case you can't serve any other loads uh that were listed in that exception to 21011 C3 okay so only if that circuit feeds just a single bathroom is it permitted to utilize that exception so that gives us kind of a little bit of an overview of bathroom electrical wiring requirements uh we hope that answer a lot of your questions around that topic be sure to visit nfpa.org link and give link a try if you haven't already as you can see link is truly a window to productivity"

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"VideoID": "1882",

"Title": "‘Dangerously out of compliance’ electrical issue forces power shut off at Lake Pueblo’s ...",

"URL": "https://www.youtube.com/watch?v=tkHhR48qHJw",

"Keyword": "Electrical code compliance",

"Transcript": "WATER AND ELECTRICITY... THE TWO ARE NEVER A GOOD MIX... BUT ESPECIALLY IN A SPOT THAT HOSTS THOUSANDS OF FUN SEEKING FAMILIES EVERY SUMMER. TONIGHT - WE ASK THE QUESTION -- HOW LONG HAVE THOSE FAMILIES BEEN IN DANGER, WHEN VISITING LAKE PUEBLO'S NORTH SHORE MARINA? GOOD EVENING, I'M HEATHER SKOLD. AND I'M BART BEDSOLE. TONIGHT WE HAVE TEAM COVERAGE FOR THE SHOCKING SHUT OFF.13 INVESTIGATES IS LEARNING THAT ELECTRICITY ISSUES AT THE NORTH SHORE MARINA WERE KNOWN BY THE OPERATOR AND THE STATE FOR YEARS. INVESTIGATIVE REPORTER DAN BEEDIE JOINS US IN STUDIO WITH MORE ON THE VIOLATIONS AND WHAT THIS MEANS FOR THE MARINA'S FUTURE. COLORADO PARKS AND WILDLIFE SAYS THE MARINA IS QUOTE \"DANGEROUSLY OUT OF COMPLIANCE\" WITH THE NATIONAL ELECTRICAL CODE.BUT THE DOCK'S CURRENT OPERATORS SAY THE STATE KNEW ABOUT ELECTRICITY ISSUES LONG BEFORE THEIR POWER GOT SHUT OFF WEDNESDAY AFTERNOON. THIS IS THE NATIONAL ELECTRICAL CODE THAT THE NORTH SHORE MARINA IS CURRENTLY VIOLATING ACCORDING TO AN INDEPENDENT ELECTRICIAN HIRED ON BY COLORADO PARKS AND WILDLIFE. QUOTE \"ground-fault circuit-interrupter (GFCI) protection shall be provided for all receptacle outlets.\" THESE CIRCUIT INTERRUPTERS ARE MEANT TO PROTECT PEOPLE SWIMMING NEARBY FROM ELECTRIC SHOCK DROWNING. AT NORTH SHORE MARINA - AN ELECTRICIAN SAID QUOTE \"there is an imminent threat of electrocution to boat owners.\" \"They've known we've had electrical issues all along.\" MICHAEL CARTER HAS BEEN THE MANAGER AT NORTH SHORE MARINA FOR TWO DECADES. HE ALLEGES THAT COLORADO PARKS AND WILDLIFE WERE AWARE OF ELECTRICAL ISSUES AT THE MARINA SINCE FALL OF 2019 - WHEN A STORM DAMAGED THE DOCKS AND POWER HAD TO BE SHUT OFF. MARINA MANAGER \"We weren't informed that we were violating electrical code. Once again going back to the storm once we did all of the repairs they simply said it was okay for us to turn the power back on and we did business as usual up until yesterday.\" A SPOKESPERSON FOR COLORADO PARKS AND WILDLIFE TELLS 13 INVESTIGATES A MARINE DIVE CREW WAS HIRED TO INSPECT THE STRUCTURAL INTEGRITY OF THE MARINA IN THE PAST. AND NOTED MINOR ELECTRICAL CONCERNS. HOWEVER, THOSE DIVERS WERE NOT ELECTRICIANS. C-P-W SAYS THEY WERE NOT MADE AWARE OF THE FULL SEVERITY OF THE ISSUE UNTIL WEDNESDAY. AS SOON AS THEY KNEW - THEY SHUT THE POWER OFF. IT'S UNCLEAR JUST HOW LONG THIS IMMINENT DANGER HAS BEEN PRESENT AT THE LAKE PUEBLO NORTH SHORE MARINA.BUT 13 INVESTIGATES HAS LEARNED THE OPERATOR OF THE MARINA IS RESPONSIBLE FOR ENSURING ELECTRICAL SAFETY FOR BOAT OWNERS AND THE PUBLIC.REPORTING IN STUDIO DAN BEEDIE 13 INVESTIGATES. "

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{

"VideoID": "1910",

"Title": "ONLINE NOW! Trailer - The Safety of Machinery (Part of the Electrical Compliance Pack)",

"URL": "https://www.youtube.com/watch?v=L97Yj-BxGpA",

"Keyword": "Electrical code compliance",

"Transcript": "[Music] [Music] [Music] w if you work for a company that manufactures a product using Machinery whether it be a single tool or a huge automative production line there are many hazards that could affect your safety and well-being injuries reported under the reporting of injuries diseases and dangerous currencies regulations or riddle for the period of 2010 2011 so that in the manufacturing industry generally there were 27 fatal injuries to workers about 17 and a half thousand reported injuries and an estimate ated 27,000 self-reported injuries of the 11% of the reported non-fatal injuries about 19900 involved contact with moving machinery and food manufacturer had a rate of reported major injury almost twice the rate for manufacturing as a whole it's generally recognized that the ridor statistics are somewhat understated so the actual figures are probably higher now with these statistics in mind this introduction that the safety of Machinery will act as a guide to the Maze of standards and legislation which surround this topic we'll be looking at the definition of a machine and how this differs from equipment who is responsible for the safety of a machine how to carry out a risk assessment and a risk reduction exercise responsibilities on Supply and purchase of the machine and the responsibilities of the employer when the Machinery is put into use in doing this we'll take a practical look at how the regulations and standards are used rather than going through them in detail"

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"VideoID": "1918",

"Title": "Home Inspector Seattle Discoverd Drift Water in Electrical Panel | (425) 207-3688 | CALL US!",

"URL": "https://www.youtube.com/watch?v=EcJbWnRHM\_8",

"Keyword": "Electrical code compliance",

"Transcript": "hi this is jim property inspector llc in the greater seattle area and we're a beautiful home in mercer island area and i don't know if you can quite see these drips on the water wires water hanging all over the main breaker and starting to drip down into the panel this is definitely going to be a long-term problem if not resolved anyway just another great reason to have property inspector llc home inspector home have a great day"

},

{

"VideoID": "1925",

"Title": "Webinar VOD | Advancing Electrical Safety: NFPA 70B Compliance and Continuous Thermal Monitoring",

"URL": "https://www.youtube.com/watch?v=ANCvFD5vJWg",

"Keyword": "Electrical code compliance",

"Transcript": "good morning everyone this is Drew Allen I'm the CEO of Grace Technologies thanks for joining our webinar today I've got a pretty awesome guest who I've known for quite a while uh and who happens to work for us uh Shelley degr thank you for coming on and talking to us about 70b this morning I'm excited to be here thank you so Shelly you know a thing or two about uh 70b and a thing or two about switch gear can you give everyone a little bit of your background and like why should they really trust you today well I have been in the industry for um we'll just say several decades and um and I have gained a lot of knowledge especially when it comes to um products and OEM equipment as well as um now getting more and more into the standards work so uh it kind of just parlays into what we're trying to do here at Grace in product development and making sure that we share our knowledge with um with our uh our our our little Grace World um to make sure our products stay in compliance with the with the standards and make sure that um we're sharing that information uh with everybody so so there were some big changes in the most recent revision of 70b and also kind of the status of 70b uh really changed let's jump into that because I think that that's a huge kind of piece to start to discuss it it really is and it and it speaks to kind of the the the concern or um the confusion that everybody has around 70b it's it's it's now a standard as of uh last year 20 uh 20 January 23 and you know we've received I have received a lot of emails about making sure that our continuous monitoring Solutions actually align with what 70b is actually uh stating um and so you know typically there is a the there is a an evolution to these standards where they begin as maybe a guide they move to recommended practice and then they move to a standard um which is kind of the last step and that's what 70b did last year on this uh 15th Edition so in this um version you'll see that prescri prescriptive language um where they move from the you should be doing this to you shall be doing this so uh it's a completely Rewritten standard um it really was uh designed to help facilities develop and Implement a really robust and effective uh electrical maintenance program so um as as we're thinking about NFPA 7 or the national electrical code that's really how the equipment should be installed 70 is how should we behave around the equipment but 70 is really predicated on the fact of the equipment should be properly installed and maintained and so 70b is really that properly maintained component the equipment maintenance piece of it it sure is um but but one of the things that I really want to drive home is that OSHA has not adopted 70b into law right it is 70b as well in 70E is not a legally binding regulation OSHA however can site um under its own regulations but also other standards by which um it has been you know has an industry consensus of a safety standard so in other words they can site employers for non-compliance to standards that relate to safety you know in and around this consensus standard so and how they do that is actually uh this this this bucket this General bucket that it can fall in under called the general duty clause and so this general duty Clause is what really has led to many enduser and companies to take a harder look at their electrical maintenance plan um as well as the products that they seek to integrate into their electrical apparatus as a risk redu reduction measure so Section 5 A1 says each employer shall furnish to each employee a place of employment free from recognized hazards that are causing or likely to cause death or serious physical harm to their employees so you can see how that's kind of a catch all a catch-all clause that if you're not complying they can easily cite this particular Clause as being one where they can point you to site you you know before we get maybe further on into the standards what are some of the big pitfalls of improperly maintained equipment let's talk switch gear specifically what what dangers is a improperly maintained piece of switch gear um create for a site or an employer yeah well we're employ we're definitely going to get into that um here here shortly and I've got images and and and things that we can talk about but uh around this this theory of of the industry consensus standards I wanted to also share that uh itle e it too is creating a standard uh called the P 2969 it it's in the pcic subcommittee and it is uh entitled a guide for continuous thermal monitoring of switch gear and motor control centers up to 52 KV so um it we started it in 2021 it's being written now but I can completely see how as it as it evolves like the other ones where it could be one that could be referenced by OSHA as a standard to to uh to look to or to point to so in this just real quick uh again it's it's development um we consider the topics of different applications different sensors installation uh maintenance and and much much more like um um oh uh uh thermodynamics like thermodynamics is actually uh in the in the appendix of it so really interesting uh standard that we're creating not quite um ready for prime time but we've been working really hard on it for several years now when when you guys expect to kind of release a first draft or what's the timeline on the standard of well we're trying to get it to ballot by our current pcic in Orlando uh this next month so so we just pluged pcic in Orlando we did sh is on the planning committee I believe for for that event and so if you are going to be down in Orlando we will be there um we're fun people so well we want you to come into the standard subcommittees we're doing a lot of great work we're fun people oh oh oh yeah well standards is fun okay yes corre C is very fun so diving into 70b um we're going to be specifically speaking about chapter nine and chapter nine is um is around maintenance intervals so this chapter really identifies the frequency by which um maintenance of the electrical equipment should be done so table 9.2.2 uh maintenance intervals uh really does a great job laying out the the type of equipment the scope of the work that should be done on the equipment and and the different levels of condition of the equipment and how frequently you should do these maintenance intervals for it so um in in this uh webinar we're going to really focus on the thermography part of it uh these annual inspections that they are um are asking the the enduser to do these companies to do uh around uh all equipment and depending on you know which which type of equipment and the condition your equipment is is in they give you basically the averages the annual surveying um but specifically thermography they talk about how these inspections need to be done on energized equipment annually so in other words prior to shutdown and then more frequently quarterly or semi annually if the equipment warrants it so um I I like to see you know for example in this in this image on the on the left is a is is a piece of equipment I call the thermography like a spot check informative um view but the problem is is that on an annual inspection that's less than 3% of its operating life is is all your the operating history is what you're going to see so as be as the equipment begins to age it becomes more important to obtain more and more equipment health so as we move into the ther thermography um I want to I want to just share how it really goes into how these two types of techniques continuous thermal monitoring and thermography can really complement one another to give customers the full health benefit of of of their asset so in the the chapter 7 for example it really talks about the line of sight and the you know normal circuit loading is is when you have to do your thermography and then or at least at 40% of nominal um circuit loading so uh you can see how there is a level of risk associated with the thermographers that have to do this if they are um having to open up equipment with uh being exposed to the energized components you know one of the one of the comments I've I've heard way too many times is uh you know we do our thermography every year during our shutdown and we never see a problem yeah and you know I I I uh you know I asked them well is everything on during your shutdown you know and often times there um uh you know they they start to realize that actually that equipment definitely is not under full load and so you're not going to be able to see these hotpots uh potentially as well as then obviously the safety hazard of of equipment Opera Under full load is um you know is a uh massive concern um you know so there there is there are some areas definitely where thermography is the right tool at the right time but there's definitely ations on both a safety as well as a uh the ability to really predict failures and get a a trendable data set correct in thermography you can only see so much so that's why I'm saying you know they they they really complement each other in a lot of ways in the sense that you know for example uh if you have an outdoor substation um and you do your thermography in I don't know the winter say October November depending where you are in the world um this could lead to kind of a false sense of security thinking that your full load isn't really as hot as it is so um there there are definitely instances that where they can complement each other well and and for example in this image here the image on the left you can see that this would be a great place to do a thermal imaging you know you're you are you've got your cable terminations right there in front of you but this design really didn't allow for it because of how it was built right it wasn't wasn't planned for2 of the you can only see a and C phase so B phase is completely hidden and the the image on the right shows the deterioration of mechanical connections that also cannot be con uh detected by your conventional metering of load measurements without de energizing it and you know with today's aging infrastructure I'm sure many facilities you know have come into contact with situations like this hey just uh as a quick reminder we will be taking questions throughout the webinar so we don't need to just wait till the end but I'll I'll be breaking a couple of times uh to look through the chats and to introduce any questions over to Shelly uh so feel free to start putting those questions into chats or comments that you guys may have and we would love to uh address them in the webinar all right continue on man yeah y so we are starting stting to see this Paradigm Shift where the companies are realizing that you know what I love my thermography plan I've got this annual thing going um but maybe you know I can look to putting a condition based or continuous monitoring solution of some sort in as well to complement it that way I get the full picture health and that's that's kind of where we're seeing uh especially again this aging infrastructure where we're really seeing the um the the the shift in in more people including the standards adopting and realizing that this is a a risk reduction measure that they can deploy so um so our solution is called uh for continuous thermal monitoring is called the hotspot monitoring hotspot monitor product and and um we're bringing this up specifically because NFPA 70 speaks to the fact that continuous monitoring or predictive techniques shall be permitted um to be used now so you don't have to be um cautious about deploying a solution that you know will create a reduction in Risk but um but you just want to make sure that it aligns with the this new standard so um as we go through this p prescriptive language in 70b again it speaks to the shells and the shoulds of continuous monitoring which so it's really nice to be able to see how they have um how they've married the two together so we're going to specifically talk about a uh this table which is in the appendix or the annex of 7b8 9.1.1 which relas segments each layer of um of equipment or sensor deployment that you can use to benefit yourself and and like we were talking earlier about an Roi kind of kind of scenario where um in this continuous monitoring solution you not only uh can deploy it but you can also take that and adjust your maintenance intervals accordingly so if you've got a continuous in our case a continuous thermal monitoring solution you can deploy that and um and as long as it is measuring actual values on a real time basis and alarming uh that's when you can actually expand your maintenance interval for thermography to Something in excess of one year so you can go two three years if you feel that both in connection with one another are are presenting the best health um data that you can get on your equipment you know this might be the first time I have ever seen Predictive Technologies listed in a standard so I don't know if I'm wrong on that you're the standards Queen um but I I that's the first time I've actually I've really heard of Predictive Analytics being used to come to electrical kind of reliability it's certainly a nice to see and it shows you where the industry is is Shifting to um they recognize that the risk to uh electrical Personnel is something that they want to try to reduce so any kind of exposure you know presents a risk so anytime they can take that data and move it away from the equipment is a is a great thing yeah and I mean in order to get to predictive you do need loads of data and models and and so um you know this is another area where a continuous thermal monitor that may also have additional inputs for coming from current or the humidity inputs or various other IO coming into that sensor now it gives a much broader Health perspective of the gear and can really predict and regress those Trends into the future exactly and and you can see in this table that the next level is the predictive techniques and that is where you're bringing other sensors together to um predict a health an anomaly or a health situation um that could be could be uh you know very damaging to the equipment or Personnel or whatever so we're going to we're going to stay on continuous monitoring but the next level is uh is predictive techniques you know that that kind of AI analysis of what's going on in the in the equipment so one of the questions we have here Shelly from Kevin is uh does ctm reduce the maintenance interval from 12 months it does well it allows you to go longer than 12 months it allows you to push that back uh to like I said two three years whatever you decide at your particular facility is the most appropriate uh you might find over time that the data that you're collecting is is actually um giving you the be best health scenario that you can get thereby you can reduce your costs of production down time and uh and your personnel or your contractors that you have to hire to go out there it kind of reduces that expands that window of time that you have to do those uh those thermography scans and we know what a rated temperature is on you know a piece of insulation that's going around a bus right so so we're we're really trying to make sure that even with you know we even in hot months we're never going over that that kind of insulation temperature rating and you know and various other things and so yeah expanding out our interval I mean there the the ROI on expanding out that interval must be substantial I'm I'm sure it is in every industry across the board yeah I'm sure it is um just going back to that 70b standard while we're on the interv interval is yeah so someone here said that their standard has been once a year right um but Duty Cycles are also incredibly important correct correct you know and so if you if your standard has been a year but the makeup of your facility has changed and how frequently things or Duty cycling has changed that would also alter potentially how frequently you have to do maintenance yeah your predictive techniques are now uh are now contributing to your electrical maintenance plan um all of it is a plan and it's an evolving plan but um what the standard is is saying is that they are now recognizing and hopefully some of the insurance companies will too will recognize the reduction in risk for incorporating um you know these types of technologies that um complement one another to give you that he best health diagnos diagnosis yeah I've seen I've seen some videos of um bus bar on on motor inrush currents you know and all I mean it looks like a you know it looks like you're in an ocean of copper moving through as that as that sine wave pulses through uh the copper bus bar and so the stress on these joint joints on any sort of on or off motion is pretty substantial um it's it's a it's a really fascinating thing to see those kind of physics right and you know it's it's crazy well and and that's kind of why we chose um this particular technology that that we offer here at Grace for continuous thermal monitoring and that is that we utilize a non-conductive polymer fiber so when you look to integrate it into your equipment including all the way up and through uh your medium voltage equipment you know we we know that it has been tested um for not only a repeatable performance but also that it's because it's a non-conductive polymer fiber we know that we're getting right on the Hotpot um the potential hotspot we're getting right at those mechanical connections that um are the first to have issues when they have a degradation breakdown we don't we have loose connections all those are are easily picked up and quickly picked up by a solution like this and we like it because when you get down deep into into the equipment removing covers and barriers that you only want to do you know once infrequently um you're able to get you know really bad information on a um on a a repeatable performance when you and you don't have to do any kind of calibration for it I really wonder what this statistics are that those barriers get put on properly after after maintenance is performed hey human error is human error we we we've seen it I'm sure no one's forgotten a bolt or a few it it's just a nature it's just the nature of humanity um you get in a rush you're trying to get things back up um you know it it happens right it happens but we we really in um we really like the way our techn ology does it because we are not using a wire we're using the a a phosphorescence technology whereby um we are pulsing a an just an LED light uh down the polymer fiber it's reflecting you know off this compound in the probe tip and it's reflecting back so we watch that light wave attenuation over time to calculate the temperature so you know there's a lot of different Tech Technologies out there um we feel like this is kind of been a tried andrue it's been in the market since around 2010 um we feel like it's a tried andrue uh through all the different Industries uh oil and gas is where it began but it has evolved into um into Industries across the board I thought it was fascinating that the original kind of patent on this technology I believe was uh Japanese base for MRI monitoring yeah yeah and and so it's and that was all the way back in the 80s I believe and so it's really come a long long way as well as orders of magnitudes of cost reduction part of it yeah absolutely they they a lot of Transformer manufactur or Transformer thermal monitoring um was used with this technology this isn't uh you know anything that's brand new to to the market by any by any means um these are just the the basic specifications of it uh but I really want to highlight uh two things one um that the standard really focuses on and the and the it's the ability for the continuous monitoring solution to have alarming capabilities that's really important not only are you getting the real time data in and being able to watch that over time but also the the the the alarming of them and our solution has a two two steps or two stages of alarming that can be that can be used as set points and I think that's uh that's it's really important because you know where your high high where your high high levels are right corre um the the integration is incredibly important uh we've had a couple of customers um potentially forget to integrate or maybe they didn't have budget to integrate uh and uh the results have not been so good um uh there's a very large food and beverage manufacturer that went ahead and installed quite a few units in their facility uh I was chatting with them kind of six or nine months after the install and uh turns out that they ended up having a pretty catastrophic failure on one of their Transformers I followed up with them you know oh my gosh did the product miss it yada yada yada he goes no Drew your guys' product performed just as intended and we were able to pull the data log from the charred remains of the you know the the switch gear and um sure enough the data log showed increasing temperatures and uh if only they would have had the budget to go ahead and integrate it into their alarming their scata their building management system however you get those alarms today it would have been really really nice um and uh so they they now make sure that if they're going to go ahead and budget for these units they're always making sure that they include an integration plan to get uh there's actually a question on that from Nelson uh can you can you be notified via your phone of any issues that occur uh yes you can not directly out of the unit the unit talks modbus rtu modbus tcpip as well as ethernet IP uh you can go ahead and take those um uh you know you can take uh data from those protocols either into however uh alarming is done today in your facility or we can also go ahead and integrate this into our grce sense uh Gateway and provide it via our cloud and give you a kind of a full data visualization um View of that as well depending on how the architectures really work in your facility uh we have the ability to really flexibly access this data and provide it up kind of any way that you would want it to um we also have a question regarding the lifetime for the sensor uh so I assume that they're they're asking for what do we anti anticipate from kind both base unit as well as that's a great question uh our team did a an accelerated life test on this sensor and it came to an excess of 75 years so there is um the way that that it is formulated there's there is you know the degradation doesn't even begin until uh likely this equipment is is did we put exploration dates on these units excellent yeah yeah we we we missed that on the on the label we we missed that we missed that on the label um so a couple other questions um talk to me about integration with um some other kind of mechanisms of integration so here we're talking about alarming but really providing this data is is the the base level floor for continuous thermal monitoring before we get into predictive but what are some other features and functionalities that having this kind of data set is able to enable on a piece of switch gear for us that's that's a great question that's a great question and and as we we look at the really the intent of of all of the the 70 um e 70E and B standards it's really about the health of the equipment so um so one of the things uh the features that we integrated into it is this feature of the discrete relay and I and I felt that it was really important to highlight this one because uh this is a mobile substation um and what they did was take that internal discreet contact that uh when that temperature of that circuit that you see it's a six bus um circuit in each one of these compartments as it reaches that high high level that discrete relay closes and they drive the fan and so what's nice is that they don't have to have the cooling fan all the time uh on all the time but as it escalates they can actually Engage The Fan and cool the circuit so I thought that was a really unique application for it um and I've seen other people do other things um with the discret relay for example um they put it into an enunciator or a data concentrator uh some uh to his his point some kind of a method by which to get an immediate alarm when it hits that high high which which we'll talk about in a minute but are are setable based on your particular circumstance stance we also have folks who just go ahead and take the data and integrate it into their HMI uh installed you know um as well or even um little flashing lights on top of a what are they called beacons yeah some beacons beacons horns you know not all the the substations are manned so these unmanned substations they heavily rely on um they heavily rely on the communication um to go you know to their their main yeah we we have a pharmaceutical a pharmaceutical install in um outside of Dublin and I believe they actually bring that into their security um like Shack area um and they have a they have an area that is uh kind of connected to their fire alarms and so that's one of the ways that they monitor it using that that relay yeah I I've I've seen people do um the coms through their protective relay and through um through their protective relay through their data concentrators through their plc's um just however you can get that notification as long as it's integrated and doesn't happen to that like what happened to that food and beverage company that's uh that's clutch so there's a question here regarding uh being integrated with the customer cmms software um so if you do go ahead and bring it into our Cloud offering we have a native integration with Rockwell automations fix um and you would be able to go ahead and and tie that data set into fix um if if you do not kind of choose to utilize our Cloud which is fine uh this device is fully Cloud optional uh you know um you can go ahead and take this data into however you're providing um information into your cmms system today so you can drop it into your PLC um or some other mechanism a concentrator in order to provide it into your cmms uh one we could we would love to find out probably more about which specific cmms you're using and then we can jump on a call with you and try to make sure we we create the right data architecture sure um Muhammad's asking is it is it logging the data to the cloud so I can monitor remotely or only local the HSM itself is monitoring locally in fact I think the maybe the next screen um it it has it has embedded memory right but I think there's the architecture screen on the next slide potentially um oh no so um so you this unit is data logging locally um and but provides the the connectivity out via ethern IP modbus R2 or modbus tcpip by adding our Gateway either um uh one of our Cloud Gates either VI LTE or Wi-Fi we're able to go ahead and and bring that data that's just local or even potentially inaccessible in remote locations up to the cloud uh I think we've even had conversations recently with clients uh looking to put starlink on their uh on their units and as long as starlink is talking Wi-Fi we can go ahead and provide a Wi-Fi uh connection to the cloud um via you know even a starlink offering for really remote locations um uh Robert would love uh in uh some um more followup around the fix integration we do hey Robert we do have I believe uh some webinars uh regarding our grce sense offering and fix but we'll go ahead and get those follow-ups to you keep the questions coming in we I love to we love to take them and that helps us really make sure that we are targeting and answering what you guys really want to know um and also towards the end we will be um putting a survey so if you want more information feel free to go ahead oh I'm being told it's actually now there's a survey so if you're interested in getting more information on this or you just want to chat with Shelly because she's awesome uh feel free to um go ahead and put some information in and fill out the survey and we would love to uh contact uh and connect with you guys more who doesn't need more friends all right bring it on uh so these images um just little pictures here of installation of our particular product um medium voltage uh cable terminations on the bus work on switches on fuses low voltage medium voltage um we've we've really got you covered um with uh with our solution but but speaking about connectivity you know I um I created this little drawing because of a lot of Midstream applications um and customers that were coming saying that they had this this outdoor um equipment and they wanted to make sure that they got this continuous thermal monitoring solution but they didn't want to open the door not only opening the doors to their um their components are going to allow contaminants to get in and the the you know heat and whatnot but they went ahead and added the the grace port to allow them if they did not have the ability to network it via the cloud or via know that this unit is logging memory it's got memory it's logging the data um in intervals and then they're able to download it to their remote laptop so as they get up to the outdoor substation this unmanned substation they're able to plug right in download the data and um and then say come back in a month I think is what they did is is on a monthly rotation um but in that um we have this embedded web page so in this embedded web page we have you know all the things that you would do to uh make the the setup unique to your application now we have some we we have some defaults that we put in it from the factory the default alarming values are straight from the itle c372 do2 standard um so it's at 90 and 105 as the high and the high high alarms those can be modified um that's up to you the internal relay it can close or not or not depending on your selection of the radio button um and then this is where you get your log information and and so uh put your logging set points where you download it um and it's all browser based so there's there's no software uh associated with it at all fantastic we do have a question here um are there any concerns about using these HSM or sensors in hazardous location I assume they're talking class one div 1 or class one div 2 on low voltage 600 volt applications um obviously this is not rated for class you know class one div 2 or any hazardous situation however there are enclosures that it could uh go into that would satisfy that so so just double clicking on that for a minute you you need to be able to put the the base unit the module in a hazardous location rated um enclosure enclosure um the fibers are non-conductive uh and so there there's no power running to Those sensors um they are not really intended for outdoor use though well they're not they're not UV rated however most people just put them in a conduit of some kind even if it's a flex conduit just to give it a little bit of protection from um from the UV yeah Craig we'll we would like to get more understanding of your application um and so we'll um you know we can connect with you kind of offline to to understand where you're looking to run these and then uh to to further what Drew was talking about as far as integration again we do have if you are a a Rockwell Centric um facility we do have the Eds file that would be easily downloaded into the Rockwell platform where you can um all the mapping exists and it makes it super easy to do the integration of this particular product but at the end of the day like we were like we were speaking about before um it's all about an this analysis of health so however you bring your sensors in however you uh whether you're looking at a relation relational um relationship between different sensors or just phases of temperatures in and of itself to be able to Trend them and map them is uh really of of crucial importance so for example on the left you see the the warning of the temperature increase with a constant temp with a constant current that's that's something that would be an alarm for you and then um but if you saw this linear relationship with uh with temperature and current expecting as current Rises temperature rises then uh you would say okay that's uh that's not something we should be alarmed about so just kind of putting a you know a a face and a and a picture to what your sensors are doing how your equipment is behaving is really the the optimal goal for these types of Technologies and finally you know 70b really at the very first chapter the very you know one of the first paragraphs it speaks to that nothing in this standard is intended to prevent the use of systems methods or devices of equivalent or superior quality Effectiveness and safety over those prescribed in this standard which means they're very open to whatever uh your choice is to keep Safety First you know at the Forefront of the electrical maintenance plan you know one thing we didn't quite hit on um for those of you who have not been involved in in AR flash or or seen a um a uh piece of gear get blown up um when I've talked with folks who've experienced that there's an immediate understanding of the dangers associated with uh being derel in your duty to your switch gear um you know in the insurance realm they call it a low frequency high impact event um and let me tell you every time I've talked with someone it's been a very low frequency but very high impact event high impact um you know and uh it's a really interesting thing and I think that having this this type of equipment installed and really bringing about these standard changes is really critical to um keeping people safe keeping your facilities up and running um and doing a much kind of better job of that um we do have another question any problem with using this on 600 volts and Below no this is uh this is great on all voltage levels up to uh 52 KV 52 KV um are you able to set the sampling period of when you are collecting the data or these guidelines put out by the 70b speec for continuous monitoring data sampling uh there's nothing in the standard that speaks to that um these are these are you know our our default values our the it is adjustable from Once a minute to once a day correct yes absolutely I mean so that that's that's I mean so if you're if you're if if you just start collecting a sample one time a day over the year comparably to a thermography inspection that's a 365 increase a 365x increase yes over the amount of um data channels and so and then I'm not going to do the math on air but uh you know obviously doing it once an hour and once a minute uh all of a sudden the resolution you're able to to see your switch gear Health with is uh exponentially larger uh so there there's not one set out but it would be you know I mean this is this is a lot what we did is uh if you were to log once every 30 minutes uh you would get an excess of 15 years worth of data in the logger itself before it writes over uh itself so um I would hope that um the the download of the data would be would be uh would be considered long before 16 years comes we're we're willing um you know we're going to what else do we have here Shelly just the Q&A well um feel free to ask us more questions we're going to stick on here for another uh you know 10 or 15 minutes and we are uh still excited to take any of your guys' questions we will there will be a a copy of the presentation um getting sent out correct Nick yep and so we'll be sending that out as a follow-up as well as the recording um so uh if you weren't able to screenshot all of our slides um we will because you know you do it yeah everyone screenshots the webinar slides which is great just make sure you post this to your social media your LinkedIn uh so Shelly so what are some other so talk about what a typical project looks like so hey I've got these eight switch gear lineups how do I decide what where I'm putting these um install locations walk me through what a typical project looks like what does my interaction with Grace look like what kind of help can we expect oh that's a great that's a great question um uh I typically get a oneline diagram and um we go to kind of our default which is maybe line load field line load of a breaker perhaps field terminations it also is dependent upon is it low voltage or is it medium voltage um all those factors work work into it but um but at the end of the day users usually know where they typically either do thermography and they wish they didn't have to or they would like to get some thermal readings and they can't get to it so again this is meant to complement um what our thermographers are doing now and giving the the customer just a a a broader spectrum of equipment Health yeah yeah one of the other important things too is just doing an overall criticality assessment sure um you know and I think if if you haven't done a criticality assessment kind of in your facility uh it's you know that's a that's a really really um important crucial step before we start determining which parts of the switch gear we need to be looking atre we should which ones are aging what what piece of equipment are aging which pieces of equipment you know are most critical right you you've got to make sure sure the up time is there um those types of those types of systems yeah um question do do the sensors come in different stud sizes I maybe talk about how the Oh uh the bolted connections uh the sensor is just a probe and the attachment or we call a a fixture is uh is is different there was a there was a photo later on the oh on the fixture the fixture can come in different sizes so uh the the biggest um I guess the biggest feature that you have to have on your fixture is that it's a six gauge um of the Ring lug it's for a six gauge wire that way the probe fits in it that that's the only that's the only U limitation yeah um question just kind of on costing it comes in both a nine and 18 Point Unit um with the with the fibers um you know and I think we try to we're currently at what 350 app points roughly something like that something like that yeah will this be available via YouTube or some other um yes it will be available on YouTube uh shortly probably within the next week or two couple days close couple days um any what what other kind of what are the kind of things do you think we might have gone either too fast through or some other kind of important parts to hit that you've kind of seen come up or um well I think I think one of the things that that I would really like to to Pub is the fact that there are so many standards out there so many standards that are needing input from the electrical industry and we would love to see your participation in the it pcic standards and I'm sure uh watching the NFPA 70E and 70 standards engaging these standards because if you have a very um you know a big opinion if you you've you've got this experience and you've got this opinion I really would encourage you to participate in the standards development or at least this the public input on these so we can we can kind of see you know where it is everybody's coming from we have a a larger swath of of comments to look at and and consider when writing these standards uh what's the maximum distance that you can run the sensor to the main unit 15 M 15 M right now yes correct um if you if uh if there's anyone on the webinar who is going to pcic if you guys would go ahead and drop a comment we would love to meet with you we have a Hospitality Booth what what give us give the details for the pcic pcic will have a hospitality suite um pcic is in Orlando it's at the Hyatt um we will have a hospitality suite on Sunday and Monday night and um it's in the celebration 8 um conference room and we'll have food and Bev and and uh and a lot of demo a lot of demo equipment we'd love to we'd love to share with you perfect and please go ahead and take the survey before you leave we want to know how we did man make sure that we're delivering the right kind of content to you guys and uh making sure that we're getting you the right resources uh to really be successful ful in your facility keep people safe and keep your plants productive right Nick anything further that we need to hit oh you guys got it all if not we're going to go ahead and uh sign off please go ahead and uh connect with Shelly and I on LinkedIn and uh we will talk soon thank you so much Shelly thank you so much thank you for being here today"

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"VideoID": "1946",

"Title": "Electrical Designing of G+5 Building with calculations &amp; Single Line Diagram |Total load calculation",

"URL": "https://www.youtube.com/watch?v=r780MraZpbU",

"Keyword": "Electrical system design",

"Transcript": "[Music] hello everyone this is our mayor and you're watching electrical infinity this video is based on how to do electrical designing of a G+ while building for electrical designing of any buildings it required five steps these five steps are calculation of total connected load the second one is transformer sizing the third one is circuit breaker sizing on the transformer side for the main meter panel whereas the fourth step is circuit breaker sizing for each load such as flats the last and the final step is preparation of single line diagram which we term as SLD now before going through these five steps I will explain you the basics required for designing of any building so for example G plus y it means ground plus five floors it contents to be has K 3 BHK and 4b has cape flats also for to be has cape flats a one phase supply is used whereas for 3 BHK a three phase supply is used the energy meters were required for these three meals k + 4 vs k plants are according to the standards provided by the government so the standards of Indian government for electrical designing of building or energy meter are these so for to be hence Cape Flats we need a 5 kilowatt energy meter whereas for 3 BHK we required at 7.5 kilowatt and for 4 bh k 10 kilowatt energy meter similarly for a 3 BHK villa of enoch oil a 10 kilowatt energy meter and for 4 b sk will require a 15-kilowatt energy meter let's start with the 5 steps I showed you earlier for designing of G + 5 billing let us assume that this building has are 3 3 BHK flats on each floor which means total 15 3 BHK plants in this building similarly 3 4 B hence cape flats on each floor which means total 15 for BHG flats in this building the first step is the calculation of total connected load total connected load is equal to total flat loads plus a total common load total common load includes leaves bore perms water pumps and a lighting lighting of a lobby area and garden so for a lift we are using our - 7.5 HP lifts one bore pump of Phi H P one water pump of Phi H P and lighting load of 6 kilowatt let us now calculate the total common load connected as we are using two lifts of Phi has P H so 7.5 HP into 0.746 kilowatts 1 HP is equals to zero point seven four six kilowatt so for conversion we are multiplying into a point 746 and we are using two lifts so two numbers seven point five into 2 into 0.746 which is equals to two well kilo words whereas for bore pumps 5 HP into 0.746 into 1 as we are using just one bore pump so it is equals to 4 kilowatt similarly with the water pump we got a total load of it as 4 kilowatt 5 HP into 0.746 in the one is equals to 4 kilowatt the last one in the common load is a lighting for example we are using a 30 watt slide 230 watts light and this gives us a load of around 6,000 watts which is equals to 6 kilowatt so the total common load is 2 L plus 4 plus 4 plus 6 is equal to 26 kilowatts so the total common load is 26 kilowatt thus we have calculated a total common load now we have to calculate a total flat load connected for this we have to consider total flats 3 BHK and total flats in Phi B has K for total flats in three BS k we have got 15 total flats and we are using a 7.5 kilowatt energy meter in that as I have explained you earlier on these 5 floor we have 3 3 BHK flat each so 3 5 0 15 similarly for a for bsk flats - so 7.5 kilowatt into 15 equals to 1 to 1.5 kilo watt which is approximately equal to 113 kilowatts and similarly with for BS k we are using a 10 kilowatt energy meter as you can see here for 3 BS k we are using 7.5 kilowatt energy meter so for 4 b HK the total load is 10 kilo watt into 15 which is equals to 150 kilowatt thus adding of these give us the total loads of the flat which is equals to 113 plus 150 equals to 263 point to 63 kilowatt thus the total connected load each sequels to total common load plus total flat load which is 26 kilowatts pulse plus 263 kilowatt which is equals to 289 kilowatt the first step is not yet finished we have to find the peak demand or a potential demand to complete this first step so the demand factor is recommended by the client which is 60% as in my case so the demand factor formula is demand factor is equals to peak demand divided by total connected load so the demand factor in India for residential commercial and industry is the according to the standards so for India the required demand factor in residential is 50% to 70% whereas in commercial it's from 70 to 90% and in industry it is 125 percent whereas in Gulf it is different this 90% is residential and commercial and 125 percent is industry so 0.6 is demand factor and 0.6 equals to potential demand by 29 is total connected load we get the value of potential demand or a peak demand as 174 kilowatt here thus we have calculated our total common load total connected flat load and a total connected load of this building and also we have calculated a peak demand which is 174 kilowatt focusing on second step which is transformer sizing as we got the peak demand as 174 kilowatt and the formula for K VA is equal to 2 kilowatt by power factor submitting these values and the power factor as 0.8 we get the value is 218 kV and for 218 KVA we can select a 250 KVA transformer but 315 kv a is safe choice so a 315 kVA transformer is recommended for this building in step 3 a circuit breaker sizing on a transformer side for emitter panel is done and we know that we are using a 315 kVA transformer so for converting this kV into ampere the multiplying factor is 1.4 I have shown in my previous video for converting kilowatt to ampere kvo to ampere you can check that so for converting kv r to ambient the multiplying factor is 1.4 from HP to ampere it is 1.5 we are asked for kilowatt it is 1.9 for a three-phase supply but this multiplying factor are different for a single-phase supply which is 6 6 & 8 as you can see here thus by multiplying 315 KVA by 1.4 we get the value as 441 ampere as you can see this is the standard chart for the circuit breaker and from these we can select 500 ampere and CCB for the main meter panel so 500 ampere MCC B is used for the main Witter panel which is a tri Pole the fourth step is the circuit breaker sizing for a load or a flat as we are using a seven point five kilo watt energy meter in a three-bean script rat the total load of a 3 BHK flat into seven point five kilowatt so for converting kilowatt to ampere 1.9 is a multiplying factor and 2 here is a safety multiplying factor so 7 point 5 into 1 point 9 into to give us a value or 729 ampere by looking at the standard charge we can select our 50 and peer MCB 4-pole MCB whereas for for beheads cave flats we are using 10 kilowatt so 10 kilowatt into 1 point 9 into 2 we get a value as 38 ampere and we can select a 63 ampere MCC way also we have to calculate a circuit breaker size for a common load - so 426 kilowatt we get a value as 99 ampere and we can use 125 ampere MCC be in these therefore we are using a 500 ampere MCC V as a main MCC be 16 we have 50 MB MCB and 60 3 ampere MCB also a 125 ampere MCC be for a common load step Phi is a drawing of a single line diagram for this building firstly I am drawing our transformer this one is a 315 kVA transformer and we are having a three lines L 1 l 2 & 3 and this is lemon kV by 440 volts transformer and this is our YB @ n as we have calculated the value of transformer earlier a 315 kVA transformer is used and the track on the main circuit breaker on the transformer side for main meter panel is this one and the value is 500 ampere MCC B and this one is a triple poll MCC be this block is used for 3 B has Cape Flats so as we are using an energy meter of 3 pitches of three-phase and the circuit breakers we are using for this the 3 BHK flat is 50 ampere MCB which is 4-pole as we have calculated it earlier and these are 3 BHK flat and these are 15 in number so similarly we can draw this like 1 2 3 up to 15 but I am NOT doing here as the diagram will be expanded so much and this block is for the for B hence Cape Flats as in the four BS Cape Flats we are using a 63 ampere MCC V which is also a 4-pole and these are all 15 numbers the energy meter used in these flats for BS Cape Flats is also of three-phase therefore you can see these values of circuit breakers 50 ampere and 63 ampere from the previous calculation as you can see 50 63 and I 125 for a common node so for a common node we are using the same three-phase energy meter and a circuit breaker as a 125 ampere MCC me which is triple pole these are this for BHK are 15 in number and we can draw it on the drawing so total we are using on almost 31 energy meters in this building this one is called as a litter panel the one I am marking with the red it is called as a meter panel thus in this building design we are using total energy meters as 31 so the total energy meters are 31 and 15 for three bsk 15 for four bsk and one for common load which give us a value as 31 now let's do a quick recap of this designing so first we have calculated total load with the help of which we got a value of a transformer and then with the value of this transformer we got a circuit breaker for this main meter panel after that we are doing a circuit breaker calculation for a 3 BHK for BSK and a common load so for 3 BHK we have got energy meter of three-phase supply which is of 7.5 kilowatt these sets are or 15 anumber I have drawn just a 1 set on destroying for 3 bits Cape Flats you can draw a 15 of these if you want and [Music] similarly we have done the same calculation for for BHK planned and I haven't shown you one yet so that's all in this video guys hope you have found this video very useful and it will help you enhance in your knowledge in electrical that's all in this video guys thanks for watching and don't forget to subscribe to electrical infinity thanks for watching [Music] [Applause] [Music] [Applause] give me like a bass guitar [Music]"

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{

"VideoID": "1955",

"Title": "Electrical Design in building construction MEP #mep #construction",

"URL": "https://www.youtube.com/watch?v=098UloW6xfk",

"Keyword": "Electrical system design",

"Transcript": "hi good morning guys hello are you hearing my voice hello good morning hello are you audible with my voice hello are you audible with my voice oh yes is it okay yeah okay okay thanks okay good morning all uh thanks for joining uh let us start we have actually like 40 minutes session so i i appreciated you all thanks for joining today i would like to discuss about you regarding the electrical design calculation here so this is our agenda today uh in order to design like our electrical system distribution boards our smdbs our final dbs we have to be need to select breaker selection cable selection load schedule preparation today i like to discuss only these three points uh let me see how much i can cover these topics okay so as i discussed like a webinar one electrical design process involves you need to know the load then wire cable sizes breakers dbs smdb mdb transformer this if you know this all the all the seven points you can design any electrical system easily this is the basic fundamental okay now let us go to in detail so as i said i discussed today about how to calculate the cable then breaker sizes let's see we all know as there is a supply to the load we need a cable to transmit our electrical current this one till the date and we doesn't get that on a wireless communication system wireless transmission very only less voltage only we got this one till the day hope so it will become in future we don't know so uh as i said here what is the parameters we have to be know one is the power and second we need to know cable then load voltage current this is the main five important parameters to design the cable or circuit breakers let us see uh this i'm discussing about any uae regulation as per the bsen 50160 standards the voltage regulation like this is all we can say that uk standards yeah as per the uk standards we have our voltage single phase voltage 230 volts and three phase voltage 400 volts and frequency is 50 h so we have a tolerance there like abu dhabi its tolerance is minus 6 percent to 10 percent then it will become 216.2 volts to 253 volts this is the tolerance we have we know the voltage right now as per the as per the regulations as per the local authority as per the standards the voltage what is the oldest few areas they use 240 volts few 230 volts some areas 220 volts it have a tolerance but as per the uk bscn 50160 standards the voltage is 230 volts and uh the three phase voltage 400 volts and if you have 400 if you have 400 volts three phase so net let us go to the next session we have we have to be calculate the our current calculations to calculate the current calculations we need to know three parameters how we have to be calculated what are the parameters let us see if there is three three uh notations are there if you notice this one ic and ic and i n see this is the this is the ic ic means ic means circuit load current i mean circuit load current means it's a load current this we need to calculate let us go in detail i just explain you the parameters once these parameters we know familiarize then we go in detail and what is in ion is a protective device nominal current rating it is nothing but breaker current i mean what is the breaker current this is called i n then we have a id id means current carrying capacity of the circuit conductors it means how much cable withstand the current it is called that current called the id how this three relation is we have circuit load current less than or equal to productive device current less than or equal to id it it's if you can if you can write in in reverse way then cable current i i'm telling you the like sequence cable current is greater than the circuit breaker current then greater than the load current so ic is a load current this value i mean we have a i x i give you example so that you can understand this one then uh let us go to the next slide so cable selection we have not only depend upon the only load current as well as there are other parameters which will decide the cable sizing calculation we we are here we need to know the load and what is the voltage drop what is the ambient temperature and installation methods it's installed in the air it's installing the ground or what these are the former four important parameters based upon that we can calculate the cable so as per the there is a country to contain different standards there but in general any basically iec standards we use generally four percent to six percent uh four percent voltage drop is we we need to consider so we go in detail now cable says calculation i give you one example let us assume we have a load is 4 kilowatt and our power factor is 0.8 this is a single phase okay then we know we all know power is equal to v i cos pi for single phase then what is the i i if we can write the i formula current is equal to this is nothing but the load current that is equal to p by v into cos pi therefore ic is equal to the the current equal to 4 into four into thousand okay four kilowatts means four into thousand four thousand watts divided by 230 voltage is 230 and cos pi is i consider as 0.5 so it is the current rating coming 21.79 ampere this is called the load current this is what we have then for this one we have to be select the breaker size for breaker size next next rating is what is the next rating we have to be select we have like uh 6 ampere 10 ampere 16 ampere 20 ampere 32 ampere 40 ampere there are the breakers standard sizes are available based upon the these breakers based upon these breaker charts we have to be select our cable uh sorry circuit breaker so the circuit breaker current rating should be 32 amperes now we come to know that we know the load current then we know the circuit breaker current what we need we need now cable cable current what is the cable current let us see then the cable current there is as per the addc standards cable current should be 1.15 times the breaker size so based upon that id 1.15 based upon 32 it will come to 36.8 amperes so as per the international standards how we can calculate the id the bs 7671 standards states that there is a grouping factor required uh in order to calculate the cable current then id the cable current it's equal to i n i n is a circuit breaker size circuit breaker current divided by grouping factor grouping factor i have a table uh i have a table i can give you the table based upon the table we consider 32 point thereby pointed it is equal to 37.64 see as per the led standards and this one the cable current almost are it's almost near now we we again i'm explaining you we have a load four kilowatts power factor 0.8 based upon this one we calculate the load current we'll get the load current once we got the load current we will uh cal we will select our breaker size the breaker size we know based upon the breaker side we we put the as a standards or grouping factor we will get the load current now we have to be check this 37.64 ampere what is the cable size and this we come we come to know from the cable chart only okay this this is the ahave cable chart this is i collected from the do cap cable charts there is a various cables manufacturers there uh for us as we know or uae do cap there and react cable there and national cable there there is a different different uh the group there is a factors there now see based upon what is our load current 37 um here's something coming so 37 ampere next rating it will be goes to the 6 6 milliampere current you see this is a single phase cable 2 2 cable single phase is your dc and this is the three phase cable we we our calculation on single phase so two cables we calculated the cable current 37 amperes so we can choose nearest nearest cable size is 6 milliampere so now again we go back to our calculation chart based upon this one uh based upon the based upon the our our calculation we got the cable size as six milliamp six mm six uh six mm square cable we we need but this is not enough to be calculated the cable then next step we have to be calculate voltage drop if voltage drop is meet the criteria then it our cable is safe let us see then how how can we check the voltage drop we have a formula voltage drop is equal to mv into i into l divided by thousand so where what is v mv this is the cable voltage drop each cable we are we all know each cable cable is made up of what conductor conductor copper or aluminium mostly we use the copper conductors copper conductor have it the conductor have its have own resistance and its own inductance so when we have a length of meter for example l l length x length having x length have a cable it have its own drop when we when we example say we will consider 10 volts when it will be sending an voltage 10 volts receiving end voltage it should not be 10 volts it have a drop you all know based upon the it have resistance it have inductance it will there is a drop so we have a cable it own drop it is called mv this own cable drop calculations given by the their cable companies this value we can know from their table then we have a i i equals to load current then we have l l is equal to length of cable this three we know then we can we can get voltage drop according to the regulation what is the voltage drop voltage drop should be less than four percent then now calculate vd we can get 230 volts vd into 230 volts of four percent how much it will come 230 into 4 by 100 it is coming 9.2 volts so our voltage drop if we calculated voltage drop 9.2 volts if less than this one our cable is okay if it is not okay we have to be selected higher rating of cable let us see load we have 4 kilowatt we have a current this is we have to take the load current load current 21.79 amperes and length i consider 80 meter length you can consider as as much as you can let let us as per the uh where you are load located then we consider i calculated v d is equal to 9.2 volts 4 so next i will check the mv value i will get the mv value from chart i will show you the chart mi value i get the chart 7.3 into load current 21.79 and then length 80 by 1000 i'll get the 12.72 volts so based upon my calculation if i selected the cable 6mm square i got the voltage drop 12.72 which is not accepted by the authority so what i have to be do i have to be go to the next size cable so let us see next next size i'm going 10 mm 10 mm square so what is the mv value for 10 mm 4.4 volts where i get this mv value i get from the from the cable chart so 9.2 it is equal to 4.4 into 21.79 this is the current and then 80 is the length by thousand i'll get the seven point six six seven volts therefore my my load i have a four kilowatt load for four kilowatt load i i select the cable sizes 10 mm square this is and what is the breaker size again we go back to let us see let us see for i have a 4 kilowatt load 4 kilowatt load i have my my breaker size is 32 amperes i have to be selected 10 10 mm 10 square mm cable this is the we have to find out uh this is our findings so let us see i explain you little bit about this cable chart cable cable chart let us see cables these are the cross section of the cable we have 1 mm 1.5 mm 2.5 mm 4mm this is 6 10 16 25 35 there is the current carrying capacity of amperes they they say that if 1 mm cross section of cable it will carry 13.5 amperes and if 13.5 amperes then it will for one meter it drop edge is 44. the this is the mv value and accordingly this all this one 35 cable 50 up to 630 cable this is just single core cables we have to be note that we have a cables have single phase single core cables two core cables three core and four cores so generally we use if single phase supply single core cables we use single care wires and we can use and then uh four core we we we have a cables worker we use so we go to the next example we can we can check the next example let us see load another example i'm explaining you let us consider load as 100 kilowatt i have a length 100 meter it's install on cable tray it is air okay then then according to same formula we apply p is equal to root 3 into v into y cos pi then we have current calculate from this current current then 100 kilowatt load 100 into 1000 divided by root 3 voltage 400 or factor pointed then we got the amperes of the il load current load current 180 amperes then what is the breaker size so breaker size it will be next size of the breaker that is 200 amperes we can select the breakers is finished easy next the complicated only you have a problem with cable size again apply the same cable size calculation then based upon the addc standards you will get 230 amperes then if you go for iec standards if you buy 0.8 243.9 amperes so again we have to be go back the chart so according to the chart we can selected our cable says us four core 70 mm cable size now we need to again cross check the voltage drop calculations let us see what is the voltage drop mv into i into ln by thousand then voltage drop again 400 what is the four percent of uh this this voltage it is 400 into 400 so 16 volts then wha i i got the mv value from the chart 0.6 then we have 16 16 volts equal to then mv value 0.6 load current 180 and then length i have 100 by thousand it's now i i got 16 volt is equal to 10.8 volts so we can we can select the cables as 70 mm square but actual scenario what what is happening this cable length i mean from the sending end voltage to receiving and voltage we need our drop should be four percentage now what is the scenario here sending end voltage means you have to be calculated from the transformer and i mean main db from main db to last load point your voltage drop should be four percentage now this according to these calculations if you consider this is from mdb to point your cable is 70 mm so it's enough but what what if if it is from feeding from the smdb then you have to be calculated from the mdb voltage drop also so better if you can assume like a three percentage voltage drop or two percentage voltage drop then you have to be calculated next cable says 4 core 95 then mb value you have it from chart 0.45 volts then you will get 16 voltage is equal to 0.45 into 180 100 by thousand eight point one volts but uh better the size of the cables is four core ninety five basically these two examples based upon these two examples we can calculate the breaker sizes and cable sizes i can give you a shortcut here what is a shortcut i i exercises many areas what i found here best thing is that if you have a load like i have a load 20 kilowatts your breaker size should be multiplied by two then your breakouts has to be 40. if you have a hundred multiply by two your breaker size should be 200 amperes then if you if you know the breaker size 200 ampere this one then automatically you are you know the breaker size then there is a chart i will give you the chart based upon this chart you can select your cable sizes up to 100 meters only after 100 meters apart then you have to be calculated based upon the same formula you have to voltage drop mv into i into l the same scenario okay see uh i i as i told you i selected from point a to from where it is coming this is the as per if there is two if you refer your material submitters if open the cable submitter cable submitter there is an ambient temperature is there this is the temperature correction factor our ambient number is this this half so this i extracted from the do cap cable again so what is the air temperature 25 degrees my my rating is 1.02 30 degrees one 35.96 40.91 45 degrees point 87 50 degrees to uae ambient temperature should be 50 degrees so therefore i selected 0.82 if you go pvc pvc what is your sizes for example ambient temperature then 0.71 pvc if there is xlb you have to consider 0.82 similar then as i now this another chart this another shot is if you there is a there is a mv values as well as current see there is a cable cross section conductor 1625 up to 500 mm square mf cable sizes there then if there is a direct direct in ground amperes if if it is cable is light on the ground your arm it will be it it withstand up to 115 amperes 150 up this is the chart and then single way duct if you install inside the conduit then your current withstanding capacity this one if it is installed directly on air and this is your your ampers okay and based upon that according to that same ground if you install ground your value this one duct your value this one here this is your mv values from these mv values as i said then uh mv value is 0.5 for 95 square mm 70 square mm 0.6 this is the mv values this is the standard copper conductors there is the values if you go to the aluminium conductors there is similar your amperes and mv values so basically here uae we are using from mdb to the final dbs we all use copper conductors so uh this is the this is an arm or this is armored then there is unarmed also similar okay if you go in detail in detail what is the current ampere what is if you get 19 16 mm cable consider no we will take 95 95 mm cable size uh 95 mm consider so 95 mm see current current at this is the current ratings so this is the voltage drop current if for see this 255 we our cable is 247 something uh so i consider like 0.45 and approximately this is you can consider 0.421 or 0.42 based upon this chart you will accurately consider your voltage drops then uh similar 120 150 240 is you know is all so there is uh how i as i told you how i can select the cable sizes you have to be i check the number of number of ways this is the method of calculation but you have to be by heart this table with any cost like a breaker you have 12 then if you have a 4 core you have to use 4 4 core 4 mm and 1 core 2 core 4 mm this chart you have to buy hot anyhow if you any interview if you want to go anyone they will ask you they will say load simple for load you they will say you hundred kilowatt load then my breaker is 200 ampere then my cable says is 4 core 95 then this is you have to buy heart if you practice like this two or three or four times this with the bihar you will be get this one if if anyone asks specifically how you calculated all these things you have to be explain all the basic steps what i said to you so this is up to up to now i discuss there is a what is the how how the breaker size is calculated how the voltage drop calculations all these things i explain you now we have uh i'm unmute all because i stopped here we have already 30 minutes condem consumed i ask you all if you have any doubts in the date anyone can [Music] if anyone have any doubts here you can answer [Music] somebody can you [Music] [Music] is it standard or like how how it is been calculated for four core one current cpu yeah this is the somebody please i'm hearing some uh like somebody put some uh i don't know can you mute someone this i'm hearing there's some sounds uh see this this chart basically this chart is how they they are based upon 100 meters they calculated same way what we done same way they calculated based upon the calculation they prepare a chart okay okay okay yeah so what but who who calculated this like from which standard or what is it see this is standards you know like each we are basically consultants as well as if you go to the addc standards as well as the diva standards the regulations they have a charts regulation they clearly mention this is a breaker size up to 100 meters you select this one these two standards you will get this chart yeah okay standard see we we follow we are actually electrical engineering if you go like a point way point how it will become all by standards there is we have like iec standards i and as well as local regulations these two we have to consider local regulations we have like addc book we have regulation book diva we have if you are from india you have a indian regulations also there is i see is indian standard regulations there this regulations if you go they will say to you this much load this much breaker you have to take this much cable size you will be select as minimum okay yeah any other questions yeah hi yeah yes calendar okay when you calculate uh you consider power factor 0.8 whether we have to consider 0.8 or 0.9 a double you know that we have to maintain 0.93 minimum or 0.95 so when you calculate my power factor 0.8 the current will be very less so that the sizing of the breaker sizing of the cable will be very high so do we have to consider 0.8 in our calculation or can we consider 0.9 if you know the power factor exactly what you have to be maintained you will be you will be considered 0.9 but if it is better if you calculated 0.8 because if you go 0.9 i mean it means it is coming the pure pure resistive loads coming if there is our load based upon our load like if you calculated like a motor loads or something you will be considered 0.62 sometimes you have to motor load 0.6.7 you have to be considered and there is a pure resistive load you you need to consider one also there is only light yeah yeah we are considering power factor correction capacitor in our main mdb so it means we are designing to maintain 0.995 or 0.93 and above so in this in that case whatever my load it is going to be 19.9 and double so based on that so if i consider 0.9 maybe i can reduce my breaker or i can reduce my cable sizing so is it acceptable this kind of design or i have to consider as a standard 0.8 as the standard basically all consider 0.8 if you i mean if you want to reduce your breaker sizes you can call the credit appointment the other it is they will accept there's nothing nothing much more because actually the capacitor uh capacitor bank calculation you know if if forget about the capacitor bank calculation if there is a no picture of capacitor bank then actual scenario i as per your load what is what will be the power factor coming this you have to be considering design this i mean in principle in general they are using yeah understand yeah yeah that's any other question yeah one more question this will select this grouping factor uh we have to consider 50 degrees by default or and and another thing is a method of laying installation you set so it will differ right because you are considering point a to in other words you are multiplying it one point one five times fifteen percentage so which one addc accepted even i simply i can multiply taking 15 percentage higher is it okay even irrespective of any kind of installation or i have to go detail the installation method no see as per the cable calculation like you will consider the current for up to the current this 1.15 from the addc regulations it stays it is regulation but if you go to the ambient time because uae ambient temperature is 50 degrees all the design based upon the 50 degrees if you your project mentions 40 degrees temperature then you can select this is accurate i mean this id is equal to 200.8 it is i mean uh i show you the slide if you see yeah yeah i saw this yeah yeah you see the slide based upon the 40 degrees you have like you know 0.99 0.91 from this chart you will select your ambient temperature based upon ambient temperature you select but you know i i mentioned here 1.15 because this is from the regulation rsb regulation books it says like that but till the date i didn't understand like diva is very clear how it will be calculated but abu dhabi i'm i'm also you know little bit confused but that's the reason i mentioned the two points uh there is no standard even though it is indoor even though it is indoor application its completely indoor application we have to go for 50 degree yes yes yes your design 50 degrees it is see it is ambient temperature basically you know what it is not from the outside temperature you you are i mean it will be one of the factor out outside temperature but when you draw your current your cable should be with stand up to 50 50 degrees temperature you know uh the insulation insulation criteria as well as uh i mean you have ac everything there but they will be designed 50 degrees you have to be 50 degrees it's a basic thing your specification says you are all your design up to 50 degrees you have to go for 50 degrees it's all up on specifications some you i mean uk they are considered 30 degrees the standard they consider yes if there is some uh some cases it goes to the 38 degrees depend but standard as per uk they are maintaining 30 degrees yeah okay okay 50 degrees i mean uae it's like 50 degrees go better anything else okay thank anyone else yeah excuse me sir actually i joined the later okay sorry i have to explain what again means uh i will i will you call me i will explain you in detail no sorry yeah no not no details are only the sort like the here they mention id id current measure like the you are saying the examples are load thousands okay one i will explain you uh can you wait any other questions i take other questions then i will explain you one more time this uh thing okay so the temperature before we if we start hearing if we have to can you speak louder yeah and now yeah yeah little bit yeah okay fine still still can you speak loudly please or you can speak in hindi if you wanna i can understand hello yeah yes now it's good hello this is aydah hi i actually stole one shot but now can i repeat that yeah see the shortcut is if you have a load hundred kilowatt load multiply by two any load multiplied by two you will get the breaker rating easy this is multiply by two what about a single case single phase yeah yeah single phase also yeah no no no no no i mean it is it is different single base we have to consider i think of 5.2 or 6.2 the factor the multiplication factor we gener you know um because as we see here you know that any here single phases we consider like a light 2.5 mm basic power you have 4 mm if you have ac load 6mm or 10mm this is basically yeah i agree with you i agree with you actually um uh to select the cable cells for a particular practices okay uh you are saying that if we have uh like 18 kilowatts load so we will multiply the 18 kilohertz into two so it will come to 36 uh amperes so the next next then is 40 amperes for the interest rate whatever you are saying uh this is for a three-phase mode the single base uh it should be um the load should be multiplied by the multiplication factor uh pipeline to us i will check again because um i as i know that this one let me catch yeah i know i know i know why because i know why because we don't go for this much of deep uh single players because we use one single piece of lights uh some parallel antennas like this anything else hello anyone any other doubts or let me explain you one more time this one call us all questions done correct because actually this is a 40 minute session only i'm looking this one white is recording oh possibly got one uh notification here uh you are upgraded and the discussion will be unlimited like the session ah really i'm not seeing that one anyhow that's a good thing okay uh again uh let us one more time i will uh discuss with you regarding this one the the one who came late or anything else see the who came the late let us see this one yeah this is the three parameters one is the ic circuit load current i n is the protective device this is a breaker current id is the cable cable current these three basic things i see is load current means we calculate from the power is equal to root 3 vi cos pi from that we calculated ic value then based upon the ic value we will be select from the chart breaker current breaker size okay then next based upon the breaker size then sorry id means the cable how much current it will carry this is called the cable current carrying capacity this one id so again the example if you i will i give you example this one like a hundred kilowatt load hundred meters if you install on cable tray your power is equal to root three vi cos pi from that i you can calculate it 180 amperes the next breaker 200 amperes then multi ah then id value you can multiply by 1.15 into 200 230 amperes otherwise you can go by grouping factor this is your your id current based upon this one you have a chart here you have a chart like uh this chart this from this chart you uh you won it how much 247 we came approximately this is unarmored okay we go for armor armored armor cables then around your cable will be considered as like a 70 mm square okay this 70 mm square you can be select as a your cable cable calculation but when you come to know not only cable calculation you have to be considered you have to be considered voltage drop whether this cable is uh okay or not okay it is gone yeah yeah then voltage drop you know the formula mv is equal to i into l by thousand from the voltage drop uh voltage drop vd is equal to 400 this is 16 volts this is the voltage of three phase voltage and mv value we will consider from the chart 0.6 then you will get we have to be see that 16 voltage is equal to less than less than or equal to 10.5 so our cable is okay but we will be go for the next cable because we will be calculated the voltage drop from main db to the up to load it's a safer side hope uh you will understand i will be uh share this what we call presentation with you okay then okay we have a time then we will be see uh next scenario as as as i discussed this is the next scenario we have like a mcb you know the mcb breakers now what are the types of breakers you know mcbs mccbs and is so on so so we go for final dbs we have mcbs mcbs are three basic types there is type b type c type d the three types what are the three types based upon the we know i n i n is the breaker current from breaker current this can be withstand up to three to five times so we can use type b domestic applications type c five to ten times of i n then we can go for commercial and industrial application type d 10 to 20 times of iron this is basically where you need the uh like tripping characteristics based upon that are how much in rush current to be it will be withstand so that we will be select the breaker types and you know next my next my main consideration is now we have to be calculated we have to be tabulated uh like 1db okay so let us see people is load now load wattage we we basically load voltage let us consider we have lighting loads and socket loads and water heaters washing machines cooker fridges motors air conditioning xyz you you have n number of things okay let us let us one by one what is lighting load lighting load we will be consider regardless if you have less than something or some something you will be considered as 100 wattage per one point and the sockets single socket single socket you will consider 200 watts and double socket you will consider as a 400 wattage okay then this is this is again i will explain you later stages because these all adc standards edd's standards you know like a little bit like difficult to understand this one uh i will i will explain you one by one okay next next we go to the water heaters general standards we consider 1500 wattage or actual rating of appliances washing machine cooker fridge motors this all what is the rating you will be considered this is the thing okay next we have a regulation as last time uh who asked me this one what is the diversity factor okay diversity factor we we know we know that if we have like 100 kilowatts or 10 kilowatts load we cannot at a time put this load one time so i mean we cannot on 10 kilowatts at one time because sometime light is on sometime sockets are on some only freeze washing machine we use whole day one hour we use washing machine our fridge it can be okay it will be run like a full load it will automatically you have to be frizz you can be considered as a full load as well as water heater you will use only one or two times this how much you are utilizing your load this is based upon that utilization there are standards a regulator other it is they consider they give one shot this is called diversified load chart i'm sorry the lighting lighting see this is there they are giving you have a lighting load residential you have a three type of projects if you see residential villas these one projects shops okay shops stores offices schools mosque business promises i mean this is all commercial this is a residential this is commercial commercial you have this one then again hotels or some like different uh different projects have different loads again they say one note in addition standard they say that however this is our standards but according to your utilization you have to be considered your diversity factor okay but in general principle we use for example light it should be on 24 hours so even though residential you put one but i'm i'm a hundred percent sure that we are not using like a hundred percent lights so according to the standards this is the charts so we go see one lighting we have a 75 percentage what is going on lighting we have a 75 percentage per uh residential and commercial we have 90 percentage and hotel accommodation we have 90 percentage sockets we use very rarely in this is the general sockets in general circuit we use 50 percentage and 70 percentage for the commercial hotels and 50 percentage all all water heater 0.5 percentage 0.7 percentage air conditioning you consider us should be considered 90 percentage you have to be considered okay this is the diversified factors based upon the diversified factors you can be you have to be select your load again okay then i have a load schedule here for one project uh let me give me one moment because i have sorry one moment please cannot be visible [Music] okay we go on small db you are seeing my screen correct yes yeah okay okay see uh very small maybe okay yeah so uh so see now this is a typical basic load schedule okay the load schedule we have we have income r you have incomer then you have rcbos it's basically abu dhabi use or you can use mcbs in as per dubai then you can use circuit references rcbos what is the what is your uh phase neutral i mean cable sizes is all eight cable sizes then cable then you have a load location number of points connect load this is all these are the basic basic things honey okay white is not coming big anyhow okay so before this one i explain you i i can i can give you how you want to calculate the you know one enclosure size okay once again there's a blackboard you you you people all know that one enclosure there okay how you want to size this enclosure there is a a formula for this one enclosure to calculation you what is inside the enclosure inside the enclosure you have you have you see this one there is a income or isolator there this one then you have then rcbos you have okay you have this one and uh i don't know how to draw with this one board is there one second okay okay see you have like one incl 1db okay this is your db enclosure to calculate this db enclosure see i explain you any basic uh thing okay don't go any standards standards this is your income okay your income are here okay my writing is poor because i'm writing with the most so you have like abu dhabi you know you have a standard you have two types of elcbs for lighting you have 30 milliampere and sorry power you have 30 milli ampere and lighting you have 100 milli ampere these are real series then you have like r y b then again you have your mcbs it's all mcbs then you have here you are neutral section then you have here eighth section okay this general general uh if you notice how the db it is look you need income work then you have elcbs then rcbos this one but abu dhabi you have a standard like uh 40 40 and 40 40 centi uh width okay with you need like 40 bit this breakers according to the breaker sizes your income work is designed but like dubai there is like uh you know you have you have like like two rows dbs okay two rows dbs and four rows uh dbs fire rose db six rows dbs you you hear this one how we will get this rose this is the main main calculator so number of rows this is the formula number of rows of breaker uh sorry number of rows is equal to sorry um my god okay number of rows is equal to total number of modules okay total number of modules modules by each row how much module and yeah i mean number of mod total number of modules divided by uh we can say like each row module like you have a one row it is one row you have a 16 modules okay or 12 modules based upon the breaker okay sorry some type of standard breaker manufacturing so you have like consider this 16 16 row so number of rows equal to total number of modules by 16 you will get the how many number of rows breaker you need how we will get this total number of modules so you will see this one number of income are incomer you consider the four modules elcb is also you consider the four modules mcb you consider one module like timer you will consider one module what is the module you see basically if you you see this one the breaker sizes if like you you will generally you will consider like four modules this one as size you have it like uh i will i will give you this one also in the presentation but i forget uh this one to add the slide that's why i draw this one okay anyhow let us let us again go back to and go back to our screen so we here basically abu dhabi or dubai we use mostly lighting you need to use a 2.5 kilowatts as a 2.5 mm wire power you use the 4mm wire as i said before acu is the 6 mm wires you have to use it this is the standards i again basic if you go to the basic one circuit what is one circuit load one circuit load as per the international standards it is 1000 watts or 1200 watts but you can keep up to i mean this is the standard basic basic one circuit means 1000 watts or 200 watts so uae up to i mean uh the west standards if you can see 1000 kilowatts or 1200 kilowatts you use the the 6 10 ampere or 16 ampere breakers and if you go to the 2000 watts sorry a thousand or 1200 you use a 10 ampere breaker and if you go to the 2000 and 2000 watts you can use a 16 ampere breaker there is a ring circuit you have to use the 32 ampere breakers is all standard based upon these things according to the load you will be design your uh what we call design your your distribution board so again abu dhabi you know to be frank with you i don't like abu dhabi standards anyhow they have like you know only for power you have other dbs you have light you can have other dbs or sometimes you can mix up so this is the power db this pdb this power db so this db have all rcbos what is rcbo rating it i mean leakage current rating 30 milliampere this is the rcbo ratings we how we get these ratings again this load based upon the connected load based upon the connected 0.5 kilowatts you selected 20 ampere because this is not i mean what we can say based upon the our specification this is my project uh load based upon our standard specification uh according to the ifc is mentioned 20 kilowatts you have to be considered 20 kilowatts this is the reason they are considered here so not required 25.5 kilowatt you have to be considered 20 ampere breaker it can go consider 16 ampere also okay so see anyhow let us see one point what is the point what is the load then you have to be balance your r phase y phase b phase loads according to that you have to be arranged for cable sizes this is the diversity factor again we check that chart based upon the chart you can provided your diversity factors as i said these diversity factors varies from according to your applications how much percentage application this is used this is uh you can suggest this is agreed between you and addc regulations you can agree or if there is a only residential based upon the chart you can provided it or according to our project we provided it this based upon the 0.7 the load coming 0.35 kilowatts okay okay so what we can say you will calculated all this one finally you know our phase this much kilowatts then you will get diversified he will apply 0.75 six so total connected low ten kilowatts diversified load one point five six allah based upon 10 kilowatt you will check you will select the your breaker ratings and cable sizes i mean i'm little bit hurry uh so sorry for that if you have any conscience here you can ask me we can explain you a little bit more because you know i explain you the how you basic this is char in this chart i mean load schedule you can prepare it by yourself it is not not big task but basic important thing you how you will be choose your cable sizes how you will choose a breaker sizes this is the reason i stress those two topics more okay you have anything else you can ask me here okay so you will be sharing this file excel file this excel file you need the section yeah i mean presentation i can share with you yeah sure i can share with you the presentation and this and the whiteboard explanation ah whiteboard explanation i will add that slide actually i will add that slide like how much how how you calculated the enclosure sizes i will add that one okay fine with that in this excellent that will be sure sure thank you okay thank you so much anything else yeah acid calculation after the calculation but uh see uh when we go to uh utc regulations uh they are saying that uh in case of designing the smdb incoming cable size [Music] final db uh it has the load the character load of data finally user uh for suppose uh 24 kilowatts okay right 24 means 48 48 amperes 48 amps is coming now for 48 amps the incoming breaker size will be 63 amperes okay for 60 km test breaker we take [Music] and all these final limits are feeding by one lesson okay now that uh yeah now the smg uh connected load is uh for suppose let us take 24 24 25 150 mm 150 kilowatts okay 24 kilohertz okay so uh when we consider the diversified load of this smdb the connector load of the smdb is 150 grams okay and the diverse value of the smdb will be less uh maybe uh 100 kilowatts or something 120 kilohertz with that okay so yeah to select the smdb uh incoming cable size which uh which load we are going to take why because uh i think here is this religiousness question that we need to take them their cell load when we are going to sell the assembly incoming cases so are we following this in practical yeah yeah it's okay it's okay it's fine fine for me i don't i don't mind it uh the basic the basic thing as i i know that you know you have to be this is a regulation only you see this regulation the rsb i as i explain you this is like i mean um what i can say that rsb i didn't understand much because no no no i will tell you i will tell you short answer is a design short answer you have to be cable sizes should be considered for full load because because if we don't know i will on all the load one time so i have to be damaged my cable no i should not damage my cable so in order to that one i will be considered i will use full formula yeah as for the design yes i can use this one then i have a voltage drop also you have to be considered this also factor you know based upon the voltage of voltage drop calculations as well as the load connected load uh these two factors we will consider but similarly i'm telling you as per the addc addc clearly says it is as per rsp regulation if you open you see this one as my slide you are seeing you're seeing me slide correct yeah this slide is saying that the cable current it should be greater than the breaker sizes it should be brighter than the load current this load current where as per the addc load current is total total connected load only it is not saying the diversified load current diversified load no you because you are cable and even it's again i'm telling you here two things are you have to be considered we as a consultants we design for the full load our cable is be basic for full load but now again uh dubai is very clear you know total total they will all design on the total load itself regardless regardless regardless diversified load because they need to know they are all basically transformer sizes up to mdb they will all consider connected load only because this is more accurate more practical also more practical more accurate and uh if you want to that these all diversified load because they want to calculate the transformers how many transformers we have to be put only transformers they provide on the diversified loads only if you want to you want to save money it's up to you you want to save money or you want to save cable sizes okay then you will be considered diversified load only diversified load only what will happen you know if you see the breakers if you i will show you there is our projects we we have future loads we have future loads we have a spare loads and sometimes this one socket means if you see now it is if one socket means you are not using 200 200 watt is it not using they are using more i mean you will be connected four for one socket you will use as a four socket it is not applicable so you are using extension cables yeah you are using extra loads so better the main important criteria cable your cable should not be damaged you should not be worried yeah finally you are saying it is safe to save yeah this is my my opinion as a consultant we will design this one but you know you know that you work like a dc projects uh so this adc is different you submit something they will approve something like that i i am very like i work i like to work in dubai because it's very clear there this hope anything else welcome welcome anything so what topics shall we know what topics we are going to talk about in the next video yeah next week we yeah you have to tell me what you like to know yeah let's see how uh so far is transformers sizes and capacitor banks as well as uh what is the key points uh to be considered other things if it is possible like your generator says calculation ups size calculation yeah yeah okay i will i will do that like without [Music] what i'm trying to say let us first of all focus on our basic core subject if we know we will cover all these topics once we done then we will go again one by one step all low current systems we will start i mean you you got it you got my point because you have in the power we have many things you know now we know only we we calculated the cable sizes and the breaker sizes only we calculate these two things now now we have to size the smdb and uh how many outgoings how many required how you calculate the smdb then transformer mdbs what are the mdbs if there is a you know if i can explain you there is a switching gear plenty of things we don't know still we don't know because as us as per me i thought that i know better but when i come to know some things i i don't know i'm know only zero one percent or point one percentage you know what you have to be how you will calculated your cross section of the bus bar how you will be selected what is i mean we are we are all depend upon the supplier no there is a iec standards there it's standard says that what you have to be look when you want to test the smdb or mdb what you will check in mdbs what are the key things you have to be check while you are go for factory test or you want to review a mdbs okay what you have to review what is the form four types how segregation is there what is ambient temperature what is a big lot of things there and in detail if i go in detail there are a lot of things still we don't know so first we focus basic things we focus like calculations we focus first initial sections go one by one it's easy for us we cover up all power then we will start low current because low current uh are not very well very well but uh i will i will put in a design section [Music] anything else because last presentation yeah last presentation this presentation i will share with you anything else last presentation in this presentation thanks so much you all okay thanks so much okay stop sure you"

},

{

"VideoID": "1971",

"Title": "Typical Marine Electrical System - Line Drawing - Main Components",

"URL": "https://www.youtube.com/watch?v=SvnuBCIyDg0",

"Keyword": "Electrical system design",

"Transcript": "on this drawing you'll see a typical marine electrical system in its basic form on a line drawing the same system may look like this we proceed by identifying the main components used and recognized internationally so here they are ac generators or alternators as they're sometimes called switchboards buzz bars circuit breakers switches fuses transformers motors instruments such as voltmeter ammeter frequency indicator watt meter power factor meter ohm meter synchroscope and other loads"

},

{

"VideoID": "1978",

"Title": "Photovoltaic Self-Consumption: Impacts on Electrical Installation Design | Schneider Electric",

"URL": "https://www.youtube.com/watch?v=rW5siODKwd8",

"Keyword": "Electrical system design",

"Transcript": "Hello, Photovoltaic self-consumption brings fundamental changes in the electrical installation. Let's discover why. When you integrate photovoltaic energy production to your building rooftop, car park or façade, there are two main ways of using it: export the produced power to the grid, or self-consume it. Exporting to the grid used to be the most popular model, because in many countries it was supported by subsidized campaigns in order to promote solar energy deployment. Today, this model is in decline because the guaranteed rates for exported photovoltaic energy have progressively decreased, becoming even lower than end-user electricity purchasing rates. Because of this trend, self-consumption, where buildings use their produced photovoltaic energy to cover their own needs, is on the rise. This is the model promoted and supported today by a growing number of countries, because it makes individuals active players in the Energy Transition. It also offers the greatest economic benefits and avoids energy transport losses. When solar production is entirely exported to the grid, the photovoltaic installation is directly connected to the electrical distribution network. The photovoltaic installation and the building electrical installation are 2 separate and independent electrical systems. The photovoltaic system, in this case, has no impact on the design of the building electrical installation. On the other hand, when solar production is used for self-consumption, the photovoltaic installation is an integral part of the building electrical installation, which brings some fundamental changes. First: the electrical installation is no longer supplied by a single source, but by two or more sources operating in parallel to the grid supply. Second: each local source will produce energy or not, depending on conditions, which means that the installation has multiple operating modes, according to energy sources combinations. Third: the photovoltaic panels produce a direct current output and use power inverters to convert the DC output into AC. For this reason, photovoltaic sources have different characteristics and behaviour compared to traditional sources such as the grid supply or electricity generators. In summary, due to these fundamental changes, the transition to photovoltaic for self-consumption raises many technical questions when designing the building electrical installation, such as: Where to CONNECT the photovoltaic production? How to CALCULATE the installation, including photovoltaic production for self consumption? How to SIZE it? How to PROTECT it? I will address all of these questions in the photovoltaic self-consumption video series. Thank you for watching and see you soon."

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"VideoID": "1988",

"Title": "The Best Power System for Vans | Watch Before You Buy Van Electrical System",

"URL": "https://www.youtube.com/watch?v=mRU80jmO7lA",

"Keyword": "Electrical system design",

"Transcript": "we're gonna give you guys an in-depth review of the most advanced power system that we're doing right now which is a viktron 600 amp hour full lithium and integrated system with the victron remote management so it just showed up go ahead and bring it in josh [Music] all right christmas morning [Music] today we are going to give you guys an in-depth review of the most advanced power system that we're doing in sprinter vans right now let's get into the specific details of what each of these components in the system does all the components are laid out here we'll start with solar this is the solar panel i'm sure you know exactly what this is this is a small one so we're just using it as an example solar panels go on the roof solar panels actually are most efficient in cooler weather so as it gets hotter your solar panel actually drops in efficiency so that's just something to keep in mind if you're looking at the charge you're getting from your solar panels and you used to get 10 amps and now you're only getting nine just if the if the weather is warm that might be the reason why and in order to manage the charge from the solar panel you will want to use a solar charge controller this is the victron mppt charge controller and this one handles 30 amps so you can do up to 400 watts of solar with this unit it's also available in 50 amps as well one important thing to note is if you're using lithium batteries you really want to use an mppt charge controller that just stands for maximum power point tracking and the long and short of it is that you will get more efficient charging especially in cloudier conditions and with lithium batteries which need a bit of a higher voltage when they're being charged towards their higher capacity the next component of the system is the battery of course this is a 200 amp hour lithium iron phosphate battery from victron it is a smart battery so with these data cables you're actually able to kind of see inside the battery and monitor the cells and do different things like that this is actually a very small and light battery for 200 amp hours another reason why we love the victron batteries is because per amp hour they actually come in a very small package so on this particular build we're going to use three of these 200 amp hour batteries so we'll have a total of 600 amp hours in the van the next piece of equipment is the bms the battery management system the victron bms actually integrates the charging from your alternator into the bms as well so when you're trying to get power from your alternator there needs to be a device in between the alternator and the batteries to make sure that the lithium batteries are not pulling too hard on the alternator so the bms here actually is a current limiter it limits the current coming from the alternator to about 30 amps and then you won't tax your alternator and burn it out too quickly lithium batteries are known to pull pull energy really quickly um when they're charging and that could be a problem so don't hook up your alternator directly to the battery and don't use cheaper battery chargers you want to have something that's high quality like this that really understands what its job is and does it properly something that the bms does is it manages the battery cells it keeps them healthy it will cut off power if it senses high voltage low voltage high temperatures or a short basically this device is going to keep the batteries from getting damaged so that you'll get a long life out of them this is the lynx distributor and what this is is basically a dc distribution panel for all of the power uses that you're going to have downstream of the batteries so you hook this up to the batteries and you have four individual fuses fuse terminals in here both positive and negative um so you can hook up four different uses off of this one lynx distributor and the nice thing about it is that it has little indicator lights so if one of your fuses blows it will actually illuminate this little led so you don't have to go digging around for the problem it will be plainly obvious what's going on right here we have a smart shunt this is a piece of equipment most people have probably never seen before if you don't use if you don't build battery systems like this the smart shunt is reading the current that is flowing in and out of the battery so if you want to know how much power you're using really this is the only way to tell it you need to have a device like this hooked up to the negative terminal of the battery and so when power is coming in you're able to read that on the display and when power is going out you can also understand exactly how much power each of your devices is using via the smart shunt this is the 3 000 watts victron inverter charger so this is going to provide your ac power inside the van since it's a charger you're also able to charge via shore power through this device so let's take a look at the shore power this is a 30 amp shore power connection this is pretty standard for what we put on a van this connects directly to the inverter so when you plug into here the inverter takes the ac power and converts it to dc power and charges the batteries the victron inverter is a true sine wave inverter so the type of power that you get from inverter does matter and some devices don't like to uh to work properly or charge properly off of inverters that don't put out a true sine wave so if you had the question is it yes it is now let's get into the last two pieces of equipment that really make this system high tech this is the serbo gx and you can think of this as the brains and communication center of the entire system so there's a bunch of ports on here on the top and the bottom and all of these pieces of equipment or most of these pieces of equipment are going to plug into here so this device can communicates with the inverter it communicates with the bms it communicates with your solar charge controller and all of that information is available for you via bluetooth on your phone or with the vrm along with the servo is the display this comes in five and seven inch so if you don't wanna use your phone and you wanna just see exactly what's going on via a small display this will do it and something really cool about the serbo is that not only will it manage and monitor all of this power equipment but you can actually plug in tank level monitors temperature sensors and some other pieces of equipment into this so for instance if you have fresh water and gray water tanks you can plug them into this and they will show up on the display another thing we like to do is monitor the temperature of our batteries and the temperature of our hot water and you can use this device also to manage and have all of that information via the app available to you the final piece of equipment i wanted to talk about and this is often overlooked is the digital multi-control so if you're using a victron inverter then you should have a controller that will limit the current of the incoming power as we said this is a 30 amp plug but often if you're plugging into your home outlet it may only be 15 amps and this will allow you to dial down the incoming current to 15 amps so that you're not constantly popping your breakers and having to go reset them in order to charge this device is actually also integrated into the servo gx so really you only need one or the other but we find to actually have a separate display with manual switches you're more likely to do the right thing if you're able to quickly do it rather than going through a few menus which you have to do with this in order to limit the current on the inverter another thing this does is you're able to turn the inverter on and off via the switch which otherwise you'd have to get to the face of this and use this button oftentimes this is kind of hidden away so when you connect the multi-control to the inverter you're actually able to turn the inverter on and off remotely which is a really nice feature there are also a bunch of cables different types of cables that come with this system different things that plug in all right so fast forward the power system has been installed in the van here so it's time for us to give you guys a walkthrough of what it actually looks like when it gets installed so the first thing to mention is that we installed the system in the infiniti power box which is a really fabulous way to go because it's designed to fit a power system with all of the wire routing and the mounting points built in so the power system really should only take a couple days from beginning to end to install when you have something to install it in if you don't have something to install it in it can be a little bit of a challenge to build something custom to house the system because it really needs to be super sturdy and give you access to the system um as you're using it in the van all right so let's take a look i'm going to pull off a couple doors here just to give you guys an idea what it looks like come on in let's take a look the first thing i'll mention is that this system that we've specced out here would work equally well in a 144 or a 170 van it's just a matter of how much space that you have for battery storage this van here has 600 amp hours there is enough room to add another 200 amp hours for 800 total in the 144 typically you're going to be able to do 400 amp hours and if you get creative sometimes you can squeeze in another battery and we always mount these as low as possible just to keep the center of gravity and the van low it's really important to have good brackets to hold the batteries in place obviously if they're moving around the connections can loosen you definitely don't want that to happen so good bracketing is very important on those and moving up into the main components we have the lynx bms which is connected to the batteries and that is the main control center where it's reading the power that's going in and out and then also keeping the batteries from getting damaged by a number of different features that it has in it connected to the bms is the lynx distributor so once you have power coming into the bms it gets distributed through the distribution panel and there's four fuses in that each of those would run to its own like set of components so for instance we would have one running to all of the dc loads that are coming off the control panel secondly the air conditioner has its own dedicated fuse off of the lynx distributor and then finally the inverter really important because that consumes a lot of energy it also has its own fuse off the distributor last piece of equipment in here is the solar smart controller we have 200 watts of solar on the van so the 30 amp solar charge controller is going to be enough to manage that so as you can see um you know power systems a lot of people think they are complicated and can be very intimidating so one of the ways that we kind of overcome that is to do really clean installations um that way the client when they they go to look in here they're not afraid of what they're looking at and if they need to do a little bit of troubleshooting it's really clear what everything is and where everything goes a big part of that is obviously having access to it you need to be able to see i don't really like to bury power systems in boxes that you'll never get into again and then the second thing is wire management i think the biggest issue with power systems that don't look good or don't function well is the wire management is just not at the level that it could be all right something to mention here you may notice in this system we're using the lynx smart bms whereas when we were at the table we suggested using this bms system for the victron batteries and the difference is if you're using your factory alternator for charging this is the bms we'd recommend it limits the current to 30 amps which helps protect your alternator but if you're getting a high output alternator like this van does then you would actually switch over to the the lynx bms which is a better bms for that type of scenario we actually did a video on the high output alternator that was installed on one of our vans so you can check out the video here if you haven't seen it and get an idea of what the high output alternator does and when you would want to use it so just just know that we actually have this system on our website and you would select whether using the factory alternator or an aftermarket alternator and then we would just send you the appropriate equipment based on what your use case is going to be this is the main part of the power system let's go up into the cabinet there and we can show you the inverter in this rear part of the cabinet we've installed the victron inverter this is the multi-plus 3000 and it manages all of the charging from shore power and then also the ac power generation and distribution through the van we have a couple of breakers here these are incoming power you have one from the solar and one from the alternator so that any power that's coming into the system can easily be isolated and then of course there are also breakers so if there was an overheat or short in the line that would trip there finally we have the serbo gx and this is the communication device that all of the other equipment can plug into and allows you to first of all connect to this display and secondly view all of the data that the system is generating both on your phone and online and finally we have the back of the power panel here these are the external devices that you need to have regular access to so they're all mounted on the outside for easy access first of all the the master on off switch is located there we have the ac breakers here there's two ac circuits in the van so each of these controls one of them a 110 volt outlet with usb and usbc built into it finally we have the gx display this is connected to the servo gx so all the information from all of these components that we just showed you is available right here on the display it's great to be able to see really everything that's going on and there's so many times when this system has helped me diagnose problems that otherwise would have been a real trick to figure out one final piece of equipment to show you guys which is our shore power connection this is where you can plug into a grid power and charge up your batteries or really run the entire van off of ac power when it's available in a few minutes we're actually going to show you guys how to properly charge your batteries which is something i don't think really gets talked about very much so stick around for that but first i wanted to answer a couple questions that you guys have about victron systems and why we use them exclusively [Music] i think most people know victron is really high quality equipment but it's definitely not the cheapest equipment out there especially when it comes to the battery so why would we use all victron and not use some cheaper pieces of equipment where we could reason number one that we use all victron is because it's just simpler to buy everything from a single manufacturer and when you're going to purchase there's certain data cables that are needed and other connections that it really makes it easiest if whoever designed the equipment thought about that from the beginning and you don't have to retrofit it later the second reason we use all viktron is because everything just works together and we're able to see into each of the pieces of equipment via the bluetooth or the display and get a sense of what might be going on with the system if we're having a problem or if we just want to understand what the state of our batteries is if you're using equipment that does not all connect together then some of it is kind of in the dark and you really don't know what's going on except for doing some basic electrical tests that will definitely take a lot longer and may not solve the problem reason number three that we use all victron and probably the biggest reason is because of the vrm which is the victron remote management system and so actually let's just jump onto the computer and i'll show you guys what that looks like all right so let's go ahead and log into the vrm and i'll show you guys what this is all about and here we have it we actually have real-time data of what's going on with the system so this is kind of the dashboard which shows probably most importantly for me the batteries the inverter and the solar those are the main things that i want to look at here so the battery for instance current voltage is 13 volts there's a draw of 1.5 amps and we have 240 hours to go at this rate within the vrm system there's a lot more than we can talk about during this video but i'll just give you a quick glance at some of the things that you can see so right now for instance we have the system overview over the past seven days the red bars being consumption the blue kind of cloud is the battery levels for that day and then yellow is solar so you can actually see here the van has been inside the shop for like the past five days and so we really haven't gotten much solar gain but um there is a little bit a few days ago and then right now it's out in the sun so it's going to be collecting solar you can actually see that right here 62 watts of power coming in from the solar panels we can also switch over to a consumption graph this just gives us an idea of what's been using power over the past several days or weeks and then finally solar again so you can see here for about the past five days no solar gain but we have the van out right now if you want more data you can go into the advanced tab and this gives you a number of different charts to look at and you can actually customize this based on what type of information that you're interested in seeing so i always look at my batteries first so right now i can see that i'm at 13 volts i'm using 91 watts current state of charge is 97 the next one here is a graph of the state of charge over the past several days so we got all the way down to 14 and a half percent at one point but right now the batteries are mostly charged and it just goes on and on we can look at the inverter we can look at any of the warnings and alarms that have have that the inverter has thrown which is super useful um and then down towards the bottom here we have a bunch of information about the solar gain that we're getting one of the other things i want to show you is the alarm log so if you look back several of the pieces of equipment will have alarms if there's a problem and one of the really neat things is you can just go into the alarm log and look at a recent alarm click on it and then it will actually display the graphs of what was happening right at the time that you had the alarm so this just gives you some insight into basically what the problem might have been right now i do know that this low voltage alarm was due to the fact that i had turned on the system while there were a bunch of accessories kind of ready to turn on and the bms shut down the system briefly and gave me a warning that said turn off some of your um your power demands and then restart the system and i did and it came back up it's just one of those things where if you have uh if you have this guidance then it's much more likely you'll be able to solve a problem rather than just you know having a multimeter and and testing different spots it's it's almost it's not impossible but the the degree of difficulty between um having having the vrm system and just troubleshoot shooting it on your own is is many times harder okay so the last thing i want to show you uh in this this is common for us because we're actually building systems for people and then they're taking them out on their trips they may not have the same level of knowledge about power systems or understand which of the components are which to the level that we do so something we're able to do is upload photos of the system into the vrm and both the client and us could look at these photos together um if we're trying to troubleshoot something and maybe we need them to check to see if a wire is loose we can literally just point right to um the component on these photos and um and then you know have have some degree of communication with them about what's what hopefully that gives you an idea of um why we we like this piece of equipment why we would recommend it to most people so if you guys have any questions leave them in the comments and we'll try to get them answered [Music] once you have your system completely installed and you're using it every day something to keep in mind is how to properly charge your batteries and i think it's something that's really not talked about enough in the industry my recommendations for charging your batteries are make sure you charge your batteries up completely at least once a month and ideally also before every big trip you're going to take so as we know a battery system like this is going to get power from the solar charger the alternator and then also from shore power and the number one best way to charge is via shore power if you want to top up your batteries and make sure that they have a perfect charge and the reason that is is just because from charging from solar and charging from the alternator the currents are fluctuating for solar panels if a sun if the sun is out and then it goes cloudy um the solar charger cannot maintain a level of charging that's ideal for charging the batteries and the same thing goes with the alternator charger the alternator charge fluctuates and if it's in the middle of a charging cycle and you shut the van off it's not going to basically ideally charge the batteries the way it would with short power so at least once a month and before every trip plug the batteries into shore power overnight and that will give you the best charge so once you plug into shore power you can expect it to take between potentially six and ten hours for your batteries to charge up completely of course that depends on how much battery storage you have but the best thing to do i believe is to just plug it in overnight and that you know in the morning when you get up and you get ready for your trip your batters will be completely topped up so one of the cool things about the victron system is that i can actually bluetooth connect to each of the three batteries that are in here and see the voltage not only of the battery in total but each of the cells which each one contains contains four cells and then the state of balance of them so it will tell you whether or not each of the batteries is balanced and that's what the overnight charging does it goes through the bulk stage and the absorption stage and the float stage of charging and then when that happens basically each of the cell gets supercharged up to its maximum maximum capacity and then all of the cells get balanced and then you have your battery working at the optimal capacity if you want a system like this in your van we have it bundled as a complete power system on our website and it includes all of the components plus all of the cables and wires that you need to get a full lithium power system like this into your van so all right everybody thank you so much for watching the power system walkthrough and we will see you guys again next time [Music] [Music] you"

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"VideoID": "1989",

"Title": "Top 5 Electrical Engineering Software | Software for Electrical Engineer",

"URL": "https://www.youtube.com/watch?v=FQJ3dCOLjSM",

"Keyword": "Electrical system design",

"Transcript": "hello viewers welcome to another video \nin this video we will going to learn the   most commonly used softwares for the electrical \nengineers as well as the electrical graduates.   All these softwares which I have \nincluded in this list involve design   development simulation and prototyping of \nelectrical equipment and electrical systems.   Please note here that all the softwares are \nnot ranked based on any priority and most of   the softwares are related to the electrical \npower system so number five on our list is   Matlab and that software stands for Matrix \nlaboratory and everything in this software   deals in mattress so this software covers \nalmost all the domains of the electrical   engineering which involves machine learning \nsignal processing Wireless communication   and above all it also covers the power \nsystem studies coordination analysis you   can also design and simulate power system and also \ndevelop control algorithm for the Power Systems   next on our list is the simulink the simulink is \na sub part of a Matlab and it is basically a block   representation of a system and this software \nis used for implementing graphical simulation   it can be used to simulate \nanalyze renewable energy resources   transmission lines models electrical transients \nand stand by switching o power system the next is the p-spice or the orcad \ndouble e p spice is a circuit simulation   application for the electrical and the electronics \nengineer here you can draw a basic analog circuit   and after that you can perform simulation and \nverification of analog and mixed signal circuits   the second on our list is the power world \nsimulator and this is a very important and   most powerful software for the electrical \npower engineers in which you can have   interactive power system simulations package \ndesigned to simulate high voltage power system   you can also perform power flow \nanalysis for up to 250 000 buses   once you have drawn a power system Network you can \nalso perform the transient stability analysis and   the voltage stability analysis and also you \ncan perform the power transfer capability of   different sources in the power system Network \nthe last but not the least on our list is the   e-tab e-tab is the most preferable software by \nany electrical design engineer it is a tool for   simulation design monitoring control operated \ntraining optimizing and automating power system   in this software you can easily draw the complex \nsingle line diagrams after that you can easily   perform load flow analysis you can also perform \nshort circuit analysis each of these Studies   have its own toolbox and it's very easy to use \nand then after the simulation the results are   generated in different formats you can also use \nit for protection and device selectivity analysis   safety and grounding and finally the power \nmanagement I hope you like my list of the software   in the next video I will publish the most commonly \nused software for the electronic engineers   thank you for watching and stay tuned \nand don't forget to subscribe our Channel"

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"VideoID": "1990",

"Title": "Building 101, Topic 4: Mechanical, electrical, plumbing systems",

"URL": "https://www.youtube.com/watch?v=vVCW13c3AsY",

"Keyword": "Electrical system design",

"Transcript": "welcome to ontario canada the temperatures here can go from negative 30 degrees to above 30 degrees celsius or more we experience all sorts of crazy rain and snowstorms weather can be very unexpected that's why heating and air conditioning is so important to residents here who want to stay cool in the summer but need extra warmth to be comfortable in the winter what this building needs is mechanical electrical and plumbing systems these include many of the elements of the building that no one ever sees but they are there they affect the quality of life for residents mechanical systems include heating ventilating and air conditioning systems that work to maintain desired temperatures and humidity levels they involve choice of energy as with oil natural gas electricity renewables for example it also includes the plumbing the toilets baths showers and sinks we see the piping supplying the water and taking away the waste water materials for drinking water pipes might be steel copper brass or plastic material for waste waters include copper steel or cast iron toilets can come in porcelain vitreous china or steel i want to use that toilet connections to exterior supply and receipt of waste are part of mechanical systems they also include air flows quality controls and switches and the runs and equipment to supply and exhaust as necessary in buildings over three floors this would likely include elevators electrical systems include choice of energy type to supply power equipment and runs to transport power in and throughout the building telecommunications automation if any controls and switches also equipment and systems for life safety especially preparation for fire mechanical and electrical engineers are specialists in these fields and they will help immensely find the right experts in or outside your team if you don't know any ask an architect a helpful tip is to remember that everyone's work must be coordinated so you and the architect and engineers must collaborate very closely to integrate the contributions a bim model can help with this"

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"VideoID": "1999",

"Title": "Different Plans and Drawings in Electrical System Design - Design, Management and Auditing",

"URL": "https://www.youtube.com/watch?v=5LbKrMqpNgY",

"Keyword": "Electrical system design",

"Transcript": "hello everyone we'll continue with our next topic which is different drawings and plans in electrical system design so first of all we'll see what do you mean by electrical drawings what do you mean by electrical plants so electrical drawing shows required information for any engineering project it is typically a technical drawing an electrical drawing consists of lines symbols dimensions and notations to accurately convey an ingenious design to the worker now what do you mean by electrical plan an electrical plan is illustrated by the top view showing the physical location of the equipment now different drawings and plans and electrical system design so the first one is single line diagram second is power plan next is elementary diagram fourth one is interconnection diagram and the last lightning plan so let's see one by one single line diagram single line diagram represents how the power is distributed from source to the end user it is a simplified notation for representing a three-phase power system electrical elements such as transformer circuit breaker bus bar are shown by the standard symbols and instead of representing each of the three phases with separate line only one conductor is being represented that's why it makes the diagram much simpler to understand the diagram indicates voltage level bus capacity fuse or breaker rating key metering and identification which will help in describing electrical distribution so as you can see all the elements are being shown in the one single diagram which makes it easier to understand this with the symbol on the right hand side next is power plan this diagram is physical plan which is drawn to scale it shows the location of all motors and other electrical loads and how they are fed cable and conduit size are also indicated in the power plan if the project is large separate diagram are often used to list their conduit and cable size next is elementary diagram also known as ladder diagram in this diagram indicates how the system is to be controlled and the typical controlling devices such as push button limit switch level switch and pressure pressure switch are shown which are used on the input side and are used to energize relay motor control call and solenoid wall which are the at the output side the diagram indicates how the system operates next is interconnection diagram elementary diagram is used as a basis for this diagram all the relays are shown in the relative position terminal number and point to point connections are shown as you can see in the diagram this drawing is used by electrician to connect the wire to each terminal interconnection diagram shows connection from one device to another as well as the detail of connection of each device next is lightning plan lightning plan is illustrated by the top view of physical location showing all lightning fixtures and other electrical lightning load this is drawn to scale and shows actual location of the lightning equipment conduit and cable for lighting are also physically shown in the lightning plan so these were all the drawings and plans used in electrical system design so that's all for this video thank you you"

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"VideoID": "2000",

"Title": "Electrical Systems in a Building | Engineering Systems",

"URL": "https://www.youtube.com/watch?v=Y3wLzo-nIX4",

"Keyword": "Electrical system design",

"Transcript": "assalamualaikum today the topic of our discussion will be the electrical systems that we use in our building so let's start first with what is an electricity because it is just a general term that we use for a variety of phenomena that take place around us like uh resulting from the presence and the flow of electric charge from one place to another the first use of electric supply was established in 1882 by thomas edition now let's have a brief know how that how the power is generated and how it is transmitted from the power generators to our homes to our buildings so basically power generation systems are a combination of a potential energy which is a stored energy and then we those power generator systems convert that potential energy into a kinetic energy which on turning into kinetic energy actually creates power electric power for us that we can use uh for running motors for a heating purpose for lighting and other conveniences of our model life now what happens is that how this electrical uh power which is generated at the power uh generator plant how it is transmitted into from the generating site uh to our houses so here is an example here is a picture showing that how this uh phenomena happens that the um potential energy that is stored here in the power plant now it is converted into kinetic energy hence it generates electricity then from that power plant that kinetic energy of the electricity it's transmitted to the transformer tk this steps up the voltage for transmission the higher the amount of voltages the higher the speed of the transmission of electricity from here it goes to towers like this these are the transmission lines and these are meant for carrying the electric charge the electricity to a long distance then uh through these kind of uh transmitters the electricity is then uh reached to the neighborhood transformer okay so at this point we up the voltage of the electricity why because uh if the electricity is passing through the cables uh with low voltage with low speed that means that there is a lot of loss of electricity while it's traveling from one point to another but as we increase the voltage there will be less loss of electricity through the these cables to these transmission lines so as soon as it reaches the neighborhood transformer here we step it down we step down the voltage because we do not need to send it to a longer distance now from here from this point it actually goes to the distribution lines which actually carry the electricity to the different buildings to houses etc and there are the transformer on pools which further step down the electricity before it enters into our buildings into our houses and this is the amount of voltage that we actually require in our houses to turn on the electric kettle or lights or tv or any kind of machinery this part here also shows that if we have any kind of solar panels attached to the building or maybe separately or if we are generating the electricity through wind power they are actually connected to the distribution lines over here which carry electricity to the houses okay so the power generation and transmission that the current is sent through transformers to increase the voltage to push it to the longer distances and then that electrical charge goes through high voltage transmission lines so from electricity generated at power plants it goes to the grid stations from grid stations it has reached electric electricity substations from there to the transformers from transformers to the power lines and then to our houses the consumers take it so the amount of volts that we receive in residential buildings is 120 or 140 volts it depends upon that how far the building is from the grid station from this point entry in the building so in urban areas uh we usually use electrical cables that are buried under the ground and they are only brought up to the entry pointed ground level or at the basement level but this is these are the pictures that are usually uh they can be seen in the world city of our areas like in ravel indian and lahore and this is somewhat this picture shows somewhat a sophisticated layout of cables uh in cities like lohar and islamabad etc but in first world countries all of these cables that you can see here they are actually buried under the ground and you can just see one pole which is the closest uh to that building or to that particular area which becomes the entry point um for the electricity to enter into the building and sometimes these entry points are also hidden you cannot see them apparently because they dominate at a basement level so uh these cables actually turn eminent in our distribution board which is also called db uh wherever there's the first convenient position so distribution board looks like this you must have seen this kind of distribution board and maybe in walls of your porch or basement so what is a distribution board it is also known as a panel board and it is a component of an electricity supply system that divides an electrical power feed into subsidiary circuits and it provides a protective fuse or a kind of circuit breaker for each circuit and common enclosure so you might have seen that for example uh this is the uh distribution board of your house and all the electricity system in your house has been divided into these four circuits maybe uh your drawing room tv lounge and dining room has this has this fuse this circuit breaker your kitchen and toilets have this circuit breaker or maybe these two are circuit breakers are allocated for the ground floor uh spaces and these two for the upper floor but so it depends how the electricity system has been divided into your place so this distribution board will be fitted with a seal box this is kind of seal box this is to prevent the db these circuits uh from the moisture that it does not enter into it and it does not destroy the insulation uh of the surface cables like these and the position the position that we choose for allocating this distribution board is it should be readily accessible both for the meter reading purpose and for the replacing fuses just in case of any circuit breaker or any of these uh fuse goes off we can really um replace this and in some cases special glass casing is provided so that the meter can be great without entering the premises that this part in this picture is made up of all steel and it's solid you cannot see through it but sometimes just uh we provide at this place glass so that without opening the door we can see whatever reading that we wish to inside the dv box distribution board now the main circuit breaker so these are also all circuit breakers but this one is the main circuit breaker by making it off we actually put off all of these circuit breakers so what does the main circuit breaker do it controls the electricity flow from your two main bias to your hot bus bars so what is the hot bus pass uh this is just a strip a metallic strip that has been provided here at the back of this main circuit breaker and this is the point where it collects the ellipticity that is coming from outside and it then it's again the same point from which the electricity is actually branched out to different uh circuit breakers inside the house so as it says that tripping off this main circuit breaker it is actually going to disrupt the 240 volts that are coming uh from the outside electricity before it reaches to the branch breaker so these circuit breakers these are also called branch breakers so another phenomena that takes place uh in our buildings which actually causes fire is short circuiting so let's now discuss that what a short circuit is and how does this thing happen so uh when we have a part of a wire that is getting current and it touches another wire via or a part of the circuit and it changes the electricity path to the one which has less resistance for example we have a battery here and these two cables blue and red ones these are attached to this bulb once we are going to on this battery as in we would allow the flow of electricity to pass through it this will actually form a circuit the electricity will come from here till this point it will on the bulb switch it on and then from this point it will go back to the battery this is how a proper circuit works electricity comes from one side and is going to another side to the battery now uh just take an example that we have a faulty wire here in which the insulation is exposed and it touches another wire like here at this point this red cable is actually touching the blue point uh blue cable here at this point this is going to um change the path of circuit the electricity instead of going to the bulb it is actually taking a short path and from here is going to this cable blue one here and then back to the battery this is this type of current flow is actually going to cause shock and sometimes this parking also happens because of the excessive amount of heat that has been produced here and this point is actually going to experience short circuiting and this will cause fire so less resistance implies more heat which causes spiral eruption so to avoid that short circuiting we actually provide a ground wire which is also called earthing wire earthing wire consists of this yellow and green color and its purpose is that it directs that excessive electric shock from electric shock from any short-circuiting hot wires into the earth through this copper metal and it prevents the electric shocks so idly all of our buildings should be provided with a ground wire or an earthing wire but unfortunately we don't make use of this now once electricity has reached to the main entrance point of our house then how does the basic white system uh works in a building how does we carry it from one point to another point within a building so wiring in the building either runs on the surface like this all right or uh like this is a switch and this is the wiring that is running from this point to another point and this is like revealed you can see it or it is concealed when we are doing the construction of the building and hence you just see these type of switches and you cannot see the cables running through obviously surface firing is cheaper as compared to the concealed wiring but the surface wiring has limited use because of the way it appears on our walls so what are the different types of electrical wiring systems that we use we use cleat wiring wooden casing and gaping wiring cts or trs or pvc sheath wiring lead sheath or metal sheets wiring and then we have and then we have conduit wiring there are adjacent types of conduit wiring according to the pipe installation that uh where we use steel and pvc pipes um they are used for firing connections and installation so um and then it can be either a open convert type or surface type or we have a recessed or concealed or underground type of conduits that we use for electrical wiring systems first of all is the cleat wiring system cleat wiring system looks like this so this system of wiring comprised of an ordinary pvc insulated wires these cables they are sometimes sheets and they are weatherproof cables and they are braided along and they are compounded held on walls or ceilings by means of plastic or wooden gravel plugs like these can you see this is the big one the these these are the recessions which actually hold the wiring into their places so this is the wooden cleat and this is the plastic clean so cleat wiring system is a temporary wiring system therefore it is not um suitable for the domestic purpose and uh in fact the fleet writing system is kind of an obsolete nowadays you can just bind them in way very old buildings but as uh the technology is improving we are trying to avoid using lead wiring systems so uh all of these wiring systems have their own advantages and disadvantages so let's first start uh what are the advantages and disadvantages of heat wiring so advantages are that it is simple and cheap firing system it is most suitable for temporary use that is in buildings which are under construction or army camping like temporary use um the cables and wires of fleet wiring systems are open in the air so if there is any fault in the cables it can be easily seen and we can readily repair it at the spot and the inspection of these type of cables is very easy and simple but all of these advantages also lead to the disadvantages that obviously appearance is not so good cleat wiring cannot be used for the permanent purpose because these wires can sag after some time and in this wiring system the cables and wirings are open in the air therefore any kind of oil or steam or humidity rain chemicals etc anything they can affect the cable bias they can damage it actually and because of that damage there is a lot more risk of the electric shock the short-circuiting and hence the fire also the cleat wiring system is not long-lasting it's not that reliable and a sustainable wiring system the next fighting system is pattern wiring this is an old wiring system uh the process is that there is a single core or maybe a double core or three core trs cables these are the type of cables that we usually use for the electricity transmission uh within our houses from one point to another and these cables these pre-core trs cables with the circular oval shape cables they are used in this kind of wiring so these trs cables are often chemical proof and waterproof and steam proof but they are slightly affected if there is any kind of a lubricating oil nearby these wires are actually been painted by just in order to make them disappear with the white wall actually um but there is actually a wooden button here on which all of these cables are growing together and they are paint together uh by using these little brass link clips or they are also called bucket clips so these bucket clips actually pass in or fix the these um wires uh trs cables onto the wooden batten so um this wooden pattern is actually a well seasoned and straight thick wood uh the thickness of this wooden button is at least 10 mm and the these clips which are actually fastening the cables onto the wooden bottom the interval between them is 10 centimeter for the horizontal runs and 15 centimeter for the vertical runs like for the vertical the distance between this clip and this clip is actually 15 centimeter which is the vertical one and uh the interval is 10 centimeter when we have to make it the horizontal round although these ones are very closely bring together it's not 10 centimeter but yeah the advantages and disadvantages of pattern wiring is that first of all advantages wiring is obviously installation is simple and easy it is cheap as compared to the other electrical wiring systems repairing is easy um similar to the uh cleat wiring system but they are slightly more stronger and longer than cleat wiring system and customization can easily be done in this firing system disadvantages they cannot be installed where there's a lot of humidity or chemical effects or open and outdoor areas uh again because of being visible on the wall they have a high risk of fire because all of these things can actually damage uh the insulation within that cable so these are not safe from external wear and tear and weather effects because these wires are open visible to heat dust steam and smoke and we cannot use heavy wiring uh when we are using pattern wiring system okay okay so next is casing and keeping wiring casing and capping wiring system famous wiring system in the past but it is actually obsolete nowadays because of the conduit and cheap wiring system uh the cables used in this kind of wiring are pvc or any other approved insulated cables and these cables are then carried out through the wooden casing enclosures so these are actually the wooden casing enclosures these ones but they are actually painted right according to the color of the wall and their joints are like this see and this is these are the cable wires that coming out of it uh so these uh the casing is made up of a strip of wood with parallel grooves that i've got lengthwise so as to accommodate the pvc cables like these so basically this part is one thing and this part actually slides over this lower part now the advantages and disadvantages of casing and cap and wiring advantages are that it is a cheap wiring system as compared to the sheath and conduit wiring system at a strong and long lasting wiring system the customization can be easily done and the the wooden controller actually keeps the cable safe from the oil steam smoke brain etc and there is uh no risk of electric shock due to covered wires and cables and casing and gapping disadvantages are that this is there is still a high desk of fire engaging in capping wiring system and these and this system is not suitable where we have acidic alkalis or humidity conditions then uh we whenever we have to repair this wiring system we need more cost because of the need of more material which will be required and white ants may damage the casement capping of board now uh let's come to the most latest one conduit wiring this is an electrical conduit this this thing is called contoured it's a tube like structure which is used to protect the electrical wiring in a building or a structure and there are two types of contoured wiring according to the pipe installation the first one is surface conduit wiring and the other one is concealed could do it wiring the name actually both of these names actually suggest how that can do it wiring will be so the surface can do it wiring this wiring is the one which is actually installed on roof or wall on the surface of roof or wall so these are the converts and these are usually non-metallic and widths pvc uh like this plastic ones and uh here they have shown the metallic conduit wiring which is made up of steel but obviously the pvc is much cheaper as compared to the steel but at the same time the steel conduits have uh long lasting and more sustainability as compared to the pvc non-metallic conduit so uh what happens is in this uh wiring method they make holes on the surface of the wall right uh on equal distances and the conduit is installed then with the help of the ravel blocks whereas in conceived controlled wiring the converts are actually hidden inside the wall slots with the help of plastering in other words the electrical inspiring system inside wall or roof or floor we installed it with the help of plastic or metallic piping which we called concealed conduit and this type of concealed can do it wiring it's the most popular uh beautiful stronger and common electrical wiring system nowadays because all you see on the ball or on the roof or floor is this switch that's all nothing like this wiring etc nothing is visible to us therefore it actually gives us more area on the wall or on the roof to play aesthetically aesthetic ways so as i already discussed that there are two types of conduits one is the metallic into it and other one is the non-metallic into it uh metallic conduit is made out of steel and which is strong but it is costly at the same time and non-metallic into it is a solid bbc you can do it like they these ones and they are more flexible and easy to bend as compared to the steel into its advantages of quintuplet wiring system first of all it is the safest wiring system so far especially when it's the concealed can do it wiring appearance is very beautiful and there is no risk mechanical wear and tear in case of metallic pipes customization can easily be done according to the future needs so you might have seen that in the concealed contoured wiring systems you always get the provision of maybe the optical cable the cable for the tv connection tape and cable for the extra light connection and they can do it and then we conceal it we plaster it if you don't use it but just in case in future that we get the need of using those wires it is easy for us uh to install a fixture over there because all that we need to do is take off that concealed part of the can do it pull out the required cable and fix it with the appliance button whichever we wish to turn on so these conduit wiring systems uh they we can also use them in humidity and in areas where it's smoky or they have the chemical effect and this is the most reliable and popular wiring system nowadays disadvantages obviously it's a very expensive wiring system um because of the pvc and metallic pipes and the additional earthing that we have to do with the metallic pipes these and elbows etc and it's very hard to find the defect in the wiring once the um good words are concealed with plastered and then white wash then it gets difficult for us to find that affected where it is installation is not that easy and simple and there is a risk still risk of electric shock present especially in the case of metallic pipes which do not have proper earthing and grounding system so short circuiting uh is common uh in case of these uh steel conduit wiring systems and these are very complicated to manage additional connection in the future okay now let's talk about the electric installations that we need to have in our buildings so uh whenever we have to um install some electric appliances in a building we actually require a necessary design and we have to plan taking into consideration the whole requirements which will be necessary for the activities that would be carrying out in that building and for that we actually follow a number of steps and we follow these steps one by one and then we achieve our goal of electrical installation in a building so first of all we start with the planning and designing then we do the layout of working drawings then we gave an application to the electric supply company to grant us an estimated load supply and requirement of transformer or a substation we actually lay out the conduit wiring system for the underground supply lines before we do the concreting and completing the plant work then after laying the conduits in the plant work we do the conduits in the slabs and beam reinforcements um just in case we have to provide a flexing hook from fixing hope for the fans or maybe a box for the chandelier so all of these things are all provided in the slab reinforcement for main supply to consumer units here rooms so we should know before and before the uh construction of slabs and beam reinforcements that where do we need to provide our electric installations where do we have to provide the fans where do we have to provide the wall lamps or roof chandeliers or where the ac would be provided because we have to give the wiring cables according to the appliance on that wall or on that roof after that we do we do the physical marking of layout of wiring in all rooms then we provide and lay the complete wiring the next step is that we fix all the fittings and fixtures and complete all the electrical installations once all the electrical installations have been installed we do an installation test um that all of these pictures are actually working properly uh then we are actually provided by a consumer meters you know the application that we have given to the electric supply company for granting us a substation or a transformer they actually if it's a small house small building and there's already a transformer or substation present over there then we are the next step is that we are provided with the meter consumer meters then uh this thing the last point which has not actually been carried out here in pakistan but uh and abroad this is very common that all of the electrical installations are actually checked by an authorized officer of electrical supply company before they pass and see the meter for us now let's talk about a bit in detail that what do we do in a design and planning stage of an electrical installations in the building okay so the design planning of an electrical installation is actually going by the type of the use of the building and the requirement of the consumer therefore it is very essential that we first consult a licensed electrical contractor at the planning stage who is going to provide us the planning for the electrical installations which are safe to use and also efficient and use and they are adequate for their intended purpose for designing the layout of electrical installations for a specific requirement of power use it is also essential that at the planning stage the architect sits in consultation with the structural engineer with the electrical engineer and also with the developer to decide about the following things so what are those following things number one is what are the needs of accommodation for making provision of substation or do we need where should we have a meeting room or switch room where should be the services cable duct which would be the rising maintenance cables the dbs uh the circuit boards and where should be the opening and chases required in the fluids and walls for the intending electrical installations then what is the total load requirements that how many lights the building require how many fans how many power sockets it requires etc then we anticipate that in future if there is a increase in power consumption what will be the requirement of electric supply company including location and distance of main supply connection point then we discuss that what is going uh we discussed that what will be the layout of the wiring installations whether it is going to be open controlled or a concealed controlled wiring system so after collecting all the necessary information and suggestions from the other consultants it is the duty of the architect who should prepare a detailed working drawing of a complete electrical installation in consultation with the licensed electrical contractor so that is all about the requirements regarding the electrical installations within a building"

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{

"VideoID": "2020",

"Title": "Integrated Systems Designs with SOLIDWORKS Electrical 3D - Webinar",

"URL": "https://www.youtube.com/watch?v=7jJP0MGJ-to",

"Keyword": "Electrical system design",

"Transcript": "[Music] hello everyone um today we're going to be looking at solid works electrical 3D um we had a previous webinar where we looked at the schematics the 2D side of things um and then like I said before today we're going to be focusing on that solid works electrical 3D I am mallerie Becker I'm an applications engineer here at go engineer um I work solely with the electrical products and then I also have with me Steven Darcy who will be helping to answer questions so feel free to um chat any questions um there should be a question bar in the uh goto meeting or the go-to webinar um panel there and then we also have Melanie gavora she is the sales account manager for electrical so any if you're interested in getting a demo um or interested in pricing or anything like that you can reach out to Melanie um for that information and then today we are going to be looking at um the components so we're going to be looking at how the components tie to the electrical schematic as well as taking a deeper dive into the uh what the components look like on the 3D side we'll be looking at manufacturer parts Parts we'll be inserting in Parts into an electrical cabinet we will be routing wires and cables and then we're going to also show creating a 2d drawing of your cabinet then we are going to start the demo here um before I start actually I'm going to um put out a poll and um feel free to answer it's just asking about um what your current electrical process looks like so if you're um already have solidor electrical if you have electrical 3D um you know if you what you're currently using if it's something different than solidor electrical and I'll pull up the demo as you're answering that o I forgot to close the project out all right so we are going to be looking into solid works um solid works electrical 3D which is an addin inside of solid works and to access that addin it's an options or sorry not options it's the drop down and then add-ins and then there is down in that second section there's a solid works electrical add in to check now I check both boxes um on either side of that option there so that on Startup um I always pull that license I'm always in solid works electrical um and then they also get um part of the routing functionality that's part of the premium license we get the electrical tab that's a part of that and um so you can go ahead and check that and it will add the tabs available to you here um over on the right hand side we get this um part of the pallets over on the right hand side here you get this electrical tab when you turn that on so I'm going to rightclick in that and go to the electrical project management which will bring up the electrical project manager and um I'm going to go ahead and open up an existing project here but this is linked to the same this is the same projects manager that it you're using on the 2D side so you'll see the same list of projects um and be able to open those now solid works electrical because of that SQL database allows for multiple users to be working on the same project you just cannot be opening so like if somebody has the assembly open no one else can have the assembly open but you can be working on the schematic and the 3D side um on the schematic side you can have you know different people can have different pages open in the electrical schematic and be working on that together so we've got our documents over here now I can view these I can't edit them from the solid work side but I can at least view the documents so we're going to be looking at um building out the 3D panel layout for this schematic here so we've got a couple of Motors we've got a Transformer some circuit breakers and protection for those Motors and then we've got some push buttons and things as well and then these are all in um different locations so there's going to be some objects on the door um and some in the panel itself um we also get um the tools and then solid works electrical you get this um additional option with that electrical addin where you can access the projects manager and a lot of the same functionality that you can so if I need to get to any of my project um information from here I can get to that so say I want to look at the locations here so we've got a mechanical room we've got that main electrical closet that's also has a door included in that we've got the boiler room and a heat exchanger as our locations there I'm going to go ahead and open up the electrical cabinet so we're going to look at that first all right and with this so in the electrical project so I'm going to go back into here and I'm going to go into this process tab so um there are I already have the electrical assemblies added to my project um but similar to the 2D panel layout where you have your location for your assemblies um cellworks electrical 3D does the same thing it just makes it um into makes them into assemblies instead of a 2d panel layout drawing so I've got that main electrical closet and the top level so anything that has a check will get its own assembly created now what's nice about these is that I have this subassembly um this main electrical closet here I can use that and Route my wires in there so you can make sub Assemblies of these different areas and then we can put them into a higher level assembly and they'll still reference all the work that we've done in these lower level assemblies so we'll see that here um once we get into that main assembly there all right so um once I have an assembly open I also get this tab on the left hand side here and this is um should look similar to your components tree or if you have looked at the 2D panel layout um similar to how that looks there so we've got all these components here that we've added to our project now I don't have my cabinet and my DIN rail yet um so what I'm going to do is I'm going to go to my location and I'm going to go to the properties and then I'm going to add some manufacturer Parts here so I'm going to search there's not very many parts in here so I'm going to search so here's my cabinet and I'm also going to get some Den rail components here so I'm going to get some let's see Zero so I'm going to add a couple of these and then I'll add a couple of the wire ducting as well so I've added those to the location now I don't necessarily need a component number for these so that's why I've added them to the location but I want to be able to associate them so um I could insert these um if I didn't have a cabinet and everything here but what I'm going to do instead is associate so if you have a mechanical person who's building up an assembly um we can go through and Associate these things after the fact so he can be building and maybe not necessarily associating to anything in the electrical project um we can come in after the fact and do that so this is going to be some th rail here so I'm just right clicking on the tree item going to associate and selecting my 3D model I'm going to do the same thing for a couple of the wire ducts all right now I'm going to go ahead and start inserting some of the components now when I look at these components I'm going to go to the properties here first and we'll go look at the manufacturer part what's nice about this is in the library I can associate a 3D part to My manufacturer part so that when I go to insert this I can pull up the correct part automatically and the same part so the same 3D part can be Associated to multiple um manufacturer part right so a a three pole circuit breaker can be 10 amps 20 amps 30 amp you can associate that same 3D model with as long as it has all the same circuit information the other thing we have here is all of the circuit information on you know in that manufacturer part in the library this is what we're going to use to um help us to put the terminals on the 3D part so we still need that circuit information so that the wires know where to route to so I'm going to go ahead and insert this component and again it's going to pull up a component now if you noticed it snapped directly to that DIN rail um it's got some mates and things that are put on there to help to speed up the insertion process of these components so I'm going to click to place that and then we're going to go and take a look at this component here so I'm going to open that up so we can see the intelligence behind the component here so you can see here we've got some um those points on here these are um C points they are the circuit information put onto the 3D part so that the wires know where to route to it's going to use that um circuit information it's going to use the from to information from the schematic so the schematic does need to be done before you're able to Route the wires you can still build the panel up and everything like that before the schematic is done but in order to Route the wires and the cables the schematic needs to be done um and complete for that um the other thing on here are some that mate so there is a mate on the DIN rail and then a matching mate on the components to help them snap directly into place um and then the other thing on here are some faces so um it's defined that you know left side right side top and bottom are put onto the parts so that um you'll see in a minute when we want to insert multiple Parts we're able to just insert the parts and then it knows how to order them what direction they should be facing all that good stuff all right so now I'm going to go ahead I want to insert in some more components here so I want oops I'm holding shift not control so I want to put all these components um the rest of the way on this stin rail so I'm going to highlight them all rightclick and insert and I want to um change the order of these so I want my circuit breakers and then my Transformer and then my fuse here so you can adjust the order now I'm going to place the first component on the den Rail and then there is a command that's going to pop up that allows me to say how much space do you want in between these components so I'm going to say 1 and a qu inches then I'm going to hit the check mark and then this is going to process and then this is going to place all of the components for me so it's going to create a little um subassembly and then it's going to place that on the panel for me and then if I need to make any adjustments to that if I need to slide it over a bit I can slide that over that's got all those components placed all right so now I'm going to do the same thing on the second Den Rail and I am going to insert in my contactors so again I'm going to place the first one and then I'll space these out a little bit further and again go through a little bit of processing have those there all right the last thing I need to insert um into the actual cabinet here is the terminal strip so what's nice about this is it will allow me using that same functionality to insert in the entire terminal strip I don't have to insert these one at a time I don't have to select each one I can just select the terminal strip place my first terminal block and then for this uh because I want them all um connected or touching um I'm going to have zero space in between and then let the software um work its way to place those and do all the hard work for me so you can see there now I've got that terminal strip and I've got all those components placed right now we're going to move over to the door and there are some lights and some push buttons um that we're going to be adding here so I am going to place I'm just going to go in order here so I'm going to insert in H1 and again because I've developed that library and Associated these 3D Parts I'm able to just insert insert and place if I didn't have something um Associated to it I could still browse and go find my part that I'm looking for so H1 I'm going to put here in the Middle top of the door H2 I'm going to put in another row now the reason that this is also these are kind of snapping into place is there are planes that are put onto this so you can set up if you have these um configurable things you can set up your cabinet um and your like your door and your parts to easily um insert these parts especially if you're going to be re doing a lot of reuse um that helps in the future it's a little bit more time UPF front but it does help in the long run oops I think I put that on the wrong side going to delete that and reinsert that and I'll just continue on with these the rest of these buttons here so you can see with those mates we've got the buttons coming through the door there and then um I want to show you um so these go through the cabinet and um there's something inside of solid works called smart features and this is where you can add in a feature so like this is going through a door I want it to cut a hole for me so you can apply that to the part and then what we're going to do is select the face of the door and then what that will do is it will it's got that cut saved in the part and it will put that into the door so if I go and open up this door now should have a hole in it so you can set that up so those parts um automatically cut their own hole you can do the same thing with the um with components that go onto the back of the panel so for your drill holes for your DIN rail you can set it up you know where they have those holes you can set that up to you know create a screw hole um to cut through the cabinet there all right so now what I want to do is um we're going to go and Route White s but I want to take a look so solid works electrical is looking at the schematic it's looking at the from to information it's looking at the wire information for color information for gauge and size information that diameter information and then bend radius information as well and um what it will do is if you don't have any of these 3D sketches that I'm going to be we're going to be looking at here um let me whoops me pull it up here this ew uncore path so it's a 3D sketch um it has to be called ewor path um and then I've got there's more hiding in here in the door so there are sketches put on here and again they're called ew path this helps to guide the wires if we don't have anything to guide the wires along it will just create some kind of loop um path um that will probably not be what you were looking for so these 3D sketches help to guide the wires now will still have bends it's not going to be at these 90 Dee angles um as we'll see when I go to Route the wires here um and you can build those into the part so like if I open up this uh wire ducting where I would want wires to pass through I can put in this one's called ew access which is which will work just fine but I can put it into parts that I know I want wires to route through so I don't have to add that every time I'm creating a new assembly so now I'm going to go ahead and Route wires and then there are options over here on the left- hand side so a solid works route um it is going to take a little bit longer to route that but this will give you a 3D path of the wire you can also route as a 3D sketch so this will just give you sketch lines it will still give you um a length and everything like that it just won't take up um it won't create that 3D model um you can use splines which would add the curves or you could use lines um and then you have the option to do um all components and this would be all components that have an origin and a destination for the wire um so it has to see that origin and destination to be able to route or you can do selected component so if you only want to do wires coming off of these specific components you can use that selected component and then there are some routing parameters down here which are um this first one is how far it can look from a routing path to another routing path um to be able to still follow along that path this middle one is for the distance it can look from a terminal to the routing path to follow along that routing path before it just decides to make its own path and then this is spacing between the wires so how much distance you want between wires when they're routed so I'm going to go ahead and I am going to route my wires so what it does is it create um an assembly for each of the different wire styles that are used so you'll see it goes through this it went through phase one it's going through phase two it'll go through phase three and the neutral wire you know all the different wires that it can inter rout and it does take you know it takes time to route but if you think about trying to do each one of these wires individually um creating a path for each one um and then you know doing a um what's the word I'm looking for where you uh sweep around each of the sketches you can imagine how much longer that would take than just hitting a button and having the software process it so you can see it followed along those paths there are 3D sketches that helped it go along here to the door um now it doesn't always come out perfect I don't want you to think that it's just magic and it's always going to be beautiful and easy there's still going to need to be um adjustments made so and you can make minor adjustments so I can edit any of these sketches so I can edit the route and if I need to move something a little bit um I can go ahead and move you know move the sketches I can you know move the bends and things like that um if you're going to make major modifications you should really probably just reroute it um it's easy enough you can see here it made there these the sketches that were added here so you can call all of those out all right and now that we have the cabinet done now I still I'm going to put this into another assembly and Route cables that are going to go external to this cabinet but what I can do is I can create a drawing of the cabinet itself in its current state so what I'm going to do is go up to my electrical 3D Tab and I'm going to create a 2d drawing of the cabinet here and I'm going to choose the front pull that out and place that on my my page here and you can choose to show the wires or not on the the um drawing here so I'm going to keep those going to select that view and then I am going to insert in um some tables so this is solid works so all of the solid works tables um ballooning things like that all is available so I'm going to do a bill materials of my cabinet here have that pulled out and I don't currently have a title block on this page but what I can also do is once I have this created I can create a project drawing and add this to my documentation on the 2D side so I can add it as a page in my project which we'll look at here once it's created and then we have a page that includes oops includes that um Bill material and everything that you can then print out with your documentation so I'll save that drawing I'll also save my assembly I'll save everything in the assembly make sure to save those routes all right now close out of that assembly and we'll open up the main assembly and you can see the cabinet is already in here and um what we'll see is the cabinet will look like the cabinet that we just had open so we've got those components on there and all that wire information is transferred over to that main assembly all right so now I want to go and Route my cables and I am going to um go ahead and Route so that is another command on our so wires are routed separately than cables so I'm going to go ahead and Route cables um so I'm going to do that solid works route and then I'm going to do all cables there are two cables and we'll see how this routes now there is there are sketches in here as well so there are sketches inside of the conduit um and then there are sketches by the motors to help guide the wires for where to Route so I'm just going to go ahead and Route the cables and again it's getting the fromont to information it's getting any of the cable information from the schematic itself so we've got these cables that routed there's also some additional um sketches that go up to help guide these wires um into there so one of the cables routes through here comes up to this motor and then the other one goes through the wall and goes into well this a pump and you can see here so there are um ew cable points that are put onto here so there are let me open up this gland here and that is a different type of connection point that allows for when you're routing cables or multiple wires it routes them as a solid tube um and then it will break out into the individual wires at that point so if we look there's that ew cable Point here that is where that cable um goes from its outer jacket to those individual wires to go up into the terminal blocks now if these um if you're routing them there is a way to set which gland these cables are going to run into so that is the set origin destination so if I set the origin and destination of the cables I'm allowed to select the cable and then I can select the origin component which would be this cable gland and then I can go to the motor and I can select the ew cable point on the motor to ensure excuse me to ensure that um those are going to go into the correct paths and to the correct points um and then those also create an assembly inside of the um feature tree and um you're able to go in and edit them if you need to so if you need to make some adjustments uh Minor Adjustments again I would make Minor Adjustments if you need major adjustments I would try and adjust your 3D sketches um and use that as your guiding path to correcting the um and then also the parameters that are set up so similar to when you're routing wires when you're routing cables you have those parameters for how far it can look from sketches and how far it can look from connection points um to be able to still follow along that path um and then once these are routed we get links that are populated so if I go to my electrical project and look at my reports anything that has been routed now has a length associated with it so I can get that length information automatically populated into my report information so we've got the wire Styles and then we've also got the cables um another couple nice things um are there are design r checks and one of some of them associate to the see design R checks um whether you have the 3D components placed or not so I can go and add and there are quite a few default design R checks that can be added and then let me just find let's see um you can check for wires that were routed in 3D you can check for um components so the object is not inserted in 3D um so there's a few different design roll checks that will go so these wires that are in my schematic have not been routed and then these objects the object Mark have not been placed in 3D so you can do some checks as well with that so against that solid works electrical 3D addin allows you to connect to the schematic and then it allows you to use that information from the schematic manufacturer part information wire style information to be able to Route these wires and cables um efficiently um instead of having to do it manually um for each individual wire create a spline and then try and do a sweep across that so that allows us to um do that quickly and then it also allows you to get those links automatically put into those reports and then generate that final documentation there's a lot of power with that with this tool all right jump back to our PowerPoint here so goengineer does offer training um and we have resources we do have an electrical um focused team for application Engineers we offer training so there is a standard 2D training and a standard 3D training we also offer customized training so if there's something specific that you want to be trained on or you want to use custom material we offer training courses to do that um we offer that um in um like on site at one of our locations or um online we have a lot of online resources we have um YouTube um we have blog articles um lots of different things that we have um to show you um some tips and tricks with that we also offer um with your subscription you get certification tests um there is an electrical certification that can be taken um and then go engineer is almost most Nationwide um don't quite have that northeast corner covered yet um but what that means for you we have everybody um we have tech support from east coast to West Coast times so Eastern Standard to Pacific um and that means that you have extended hours for tech support so there is a phone number that's on our website as well as um you can email in as well um and from 7:00 a.m. to 7:00 p.m. central Time we have um available Engineers to help support you um we Al also offer services so like with some of the setup and things like that we offer help we can help you do that um on the electrical side or we can do that for you so if you supply us with the components without the intelligence and some data sheets we can create those components for you um we can also help you with you know um implementation services so helping get your project template set up helping you to start to build up your libraries create your schematics we can again work with you on that or we can um we can set it up so that we do that and then deliver that those services for you solid works electrical does integrate with PDM um there are a few different options we have a YouTube um video that will that shows all the different options um and then we have also other for other CAD um we have rendering animation and Cat automation um services and support for all of those things so and you can sign up and subscribe for um a go engineer newsletter um you can find us on social media you can register for training on our website um and then this was the second um webinar as a part of three series um tomorrow we'll be showing some work with p&id um so and then um the previous one was the um 2D electrical so feel free to uh we'll be having these posted online um on our YouTube channel um here in the next couple weeks hopefully and then some time for Q&A all right so we got a couple uh questions that came in uh one of the first ones was uh where's the best place to get 3D models for components um so we they you can take um any step files we just need to be able to put a plane and a point on the part so you can either go to the manufacturers or there is 3D content Central has a lot of parts I've downloaded quite a few from there um there's also the electrical content portal where it's where you can um find the manufacturer parts and then you can get the 2D and the 3D part information from there for some of the parts all right perfect and then uh can you report the length of the wires and the cables on the 2D schematic side so just on the 2D or like from the 3D going to the 2D and that I mean reply back definitely is pretty much the answer on that one yes so that seal database allows um that information to be um transferred between the two seamlessly um it's looking at that same database it's knowing which wire it's routing it's pushing that length back it shows up in the reports um if you wanted it to show up on the schematic you can also do that with a custom wire number that would call out the length information nice and then uh the last uh Q&A was just a nice job on the rules check uh they didn't know that they could run the rules check in the 3D side yes and that's all the questions and answers we have coming through awesome well thank you for yeah thank you for attending and um hanging out with us for a little bit learning more about solid works electrical 3D um and hope you have a great rest of your day [Music]"

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"VideoID": "2022",

"Title": "GE Aviation Electrical Power Distribution - Design Considerations",

"URL": "https://www.youtube.com/watch?v=ObHw148t6ss",

"Keyword": "Electrical system design",

"Transcript": "[Music] my role is to work with the customer in the early launch phase of the aircraft to ensure that we provide the best electrical system designed for them the purpose of the power distribution on board and aircraft is three roles mainly firstly to distribute electrical power to the loads on that aircraft secondly to protect the wires and the loads from any electrical Hazard and thirdly to root the most appropriate power source to each of those loads I'd normally get engaged with the customer in the 2 years prior to the aircraft launch when we try and optimize our system design to meet his aircraft needs the electrical distribution system can influence the gains to the aircraft considerably on an A380 up to 500 km of wire is needed through an intelligent design of electrical distribution system we can save maybe 100 kg of weight even on a small Business Jet at this stage we look to balance the risk against the benefit to the customer of new equipment on the aircraft and effectively we're judging whether we can bring the risk reward curve more to the left so that we're able to offer better technology that can give him greater benefits on board his aircraft the challenges with new aircraft is that they now have multiple power sources much like green micro grids have the electrical power distribution system has to manage those sources and provide Power to to each of its loads so GE uses its technology to help design equipment that can work at high voltages to help reduce the wire gauge needed to distribute to the loads operate at lower temperatures so that the units may be placed in distributed locations of the aircraft the most important role at the end of the day for the electrical power system is to keep the aircraft and the people on it safe conventionally this has been done with circuit breakers and fuses today as technology moves forward GE is using solid state Distribution Systems to provide better control for the user safer systems and health and usage monitoring systems [Music]"

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"VideoID": "2025",

"Title": "Embedded system Design (Part - 1) | Electrical Workshop",

"URL": "https://www.youtube.com/watch?v=DRA\_oro07qI",

"Keyword": "Electrical system design",

"Transcript": "[Music] today we will be discussing about the embedded system design and the discussion will be more focused on the software design so embedded software design so we'll see how embedded systems are and then are designed together so agenda for today's discussion is like we will define the embedded system first what is the embedded system how they are and then we will see the basic components basic structure of embedded systems the components of embedded systems and then then further we will go through the software architecture of the embedded systems and different tool chain use tool chains used and uh typical industrial process for the software design embedded software designs and then at last we'll see uh the future of the embedded embedded system sensors so this is the this is the agenda that will follow uh follow for this session uh take you through the predict visits uh so prerequisites for the embedded system design is like you one is to understand the different programming languages it can be assembly it can be cc plus plus rest one needs to understand microcontroller concepts the configuration different types of microcontrollers how those are configured what all services they provide how these are in slides so one has to understand the microcontroller why what things microcode will come up with uh the the very vital part of the embedded system is the real-time operating system one has to understand the concepts of operating system and then the real-time operating system what all services uh uh what are facilities the rtos provide to us so that is that is very important uh knowledge of different communication protocols like i2c spi can lens flex-ray usb bluetooth there are number of communication protocols those are there one needs to understand all those communication protocols and details uh one has to have a knowledge of electronics and one needs to i will one has to one one one must be able to read the schematics so different schematics would be there connection diagrams would be there and one has to understand those and again the last thing would be like read the data sheets of maybe different components those are there in the embedded systems and uh also of the microcontroller so these are like some of the prerequisites some of the this points we will they would deep dive uh today in the session but otherwise we will one has to go through or one needs to be well versed with this uh this point so so moving ahead to the next slide as like we will start with defining an embedded system so what is an embedded system so embedded system is a basically a microprocessor or a microcontroller based system with hardware and software designed to perform a very dedicated function within a larger mechanical or electrical system so it is so embedded system is a very specifically designed smart system that is that that performs its operations predefined operations without or with very minimal manual intervention so that is what this embedded system is so every part of your life is now filled with embedded systems embedded devices you look at everywhere in your everywhere or any corner of your house you will find some more other type of embedded devices those are there with you so this is what roughly we can do define an embedded system what it is uh so when we when we talk about an embedded systems so we will have to understand like how its basic structure is so uh the embedded systems basic structure consists of a sensor a input sensor then some signal conditioning a sensor is to like sense some physical properties that are those are happening around in the environment then there will be some signal conditioning system then there will be this microcontroller which will contain an application also has configured inputs and outputs also it will be giving us a facilities of memory and time i will discuss those parts in detail and also it will have some communication interface so a sensor with some signal conditioning data coming to microcontroller microcontroller with smart application running on top of it takes some decisions reads the data takes decisions and then drives some gives signal to output to drive something some some output devices connected through again some some sort of single conditioning so the output can be some sort of display or some sort of alarm an actuator a motor it can be anything so you can just consider some somewhere like say you you are sitting in the room and you you have a motion sensor connected to your electric device if you don't move uh the electric uh say light uh switches i switches it off so when you move your hand it has a movement sensor with it so if once you move your hand your movement sensor will detect the sensing uh the moment uh uh this it will change the movement it will it will process that signal the controller within that will sense it and then it will actuate the light signal again which was switched off uh assuming that no one there is no one is there in the room so this is very very basic example that i can talk of just to you just for you to connect to each block that we are discussing in this diagram and then there is one more block yellow in this in the below part you can see that external word now embedded systems are not just an embedded device that is that is lying in the corner of the room it is now has been connected to cloud it is like iot is the new buzzword in the market you have you you would have heard it in your curriculum so it is connected to a number of other devices as well it is connected to cloud now this is like exchanging statistics exchanging data it is exchanging the diagnostics prognostics it is exchanging a lot of information and that's why this has become essential part of embedded system as well so this is how we can say that if you see any embedded device you can very well segregate those embedded devices in this boxes so we'll now we will move to uh different components of this embedded embedded system structure that we just looked upon so so the brain of this embedded system is the microcontroller uh are you you you have you would have heard 8-bit 16-bit tattoo bit of microcontrollers in the market there are a number of players that who are manufacturing the microcontrollers this is it's a free scale it's a stm intel so there are a lot many uh silicon manufacturers available in in the market so the microcontroller what exactly microcontroller is how microcontroller is helping us to device an embedded system microcontroller mainly is providing us three things one is ios another thing is memory and third thing is timing requirements these three things are very vital apart from all other peripheral connections adcsds there are many other things as well it is providing it to us but these things are very vital part of the embedded system that microcontroller is providing us so apart from that it has uh my uh like say it like say with this part with this with these three things we will have our application programming on top of it application programming will see it in detail so just to touch base upon it it can have multiple you can you can write your application in many other languages many multiple languages and you can program it in on top of the microcontroller ios memories and timing requirements we are going to discuss in details in subsequent sections uh application programming also will come will take its slide and some subsequently selection of microcontroller so this is very very uh important part of um apart when we when we think about how the microcontroller which which microcontroller should be selected because if you if you google on uh if you if you put in like the microphone you search for the microcontroller on google you will get thousands of microcontrollers available in the network so which is the correct microcontroller that you should go ahead with so it will need a lot of uh a lot of research in that but it will need basically what you what it needs is you should be understanding the the underlying application the underlying need or underlying functionalities that for which you are going to device or design this embedded system so you should be understanding this uh the application through and through end to end right from a user interface to the output of the system so you should be understanding it thoroughly then you can be able to understand or you will be that is that is the first step that you can go for the benchmarking of the microcontroller or the selection of the microcontroller so you will need to know how many ios you need uh like say it can be like general purpose i o it can be adc it can be frequency input it can be pdf pwm there are a number of types of inputs there so how many ios you will need so you should you should be able to chalk that down on the paper you should be able to uh create your own design on the on the paper and then you will you can be able to count those ios those would be needed for you you should be able to know like how many interfaces you will be required what all the interfaces you will be required so you require uart so how many words you would require why it will be requiring why why or how many spi coming spi interfaces you would be requiring how how many i2c channels you will be requiring how how many uh channels you will be requiring so uh these are like uh these are like in hardware interfaces that you will be requiring uh to know uh to go for any decision you must be knowing like the processing time so timing requirements you must be knowing that is where like the crystal will come into picture you will understand if this microcontroller is sufficient to give me give my time timing requirements or fulfill my timing requirements you should be knowing like if floating point mathematics is required any dsp operations are required so with the with this you will start building or maybe filtering you can say perfect correctly like you will start fill out the microcontrollers you need a floatpsp operations to on top dsp operations to be carried out so that is where you you can uh filter out many of the microcontrollers uh with that how what is what what would be the the power constraints that your microcontroller would be now what would be the environmental conditions what will be the temperature it will be working on where will it be mounted so all these things is this the things with with that the future expansions that you see into that so you you should be able not only able to understand the underlying application but also the future of that application that is going to decide the microcontroller uh because then you will you will choose a microcontroller with some some additional functionalities or additional features with it which can cater you for five years ten years down the line without hurting uh you in the process and and the cost is also again one part so that that also can decide your selection of the microcontroller so these are these are very few part that i could i just quickly talked about like selection of the microcontroller but these are very essential so this is this is how you are going to decide your microcontroller and go ahead with it then it comes to the ios when when we are talking about an embedded system it is majorly about something and put something output some inter some like say i am going to touch um touch a monitor and then that monitor like a display or a mobile monitor i am touching mobile screen i am touching and then it is creating a call for me or it is creating some already it is taking a picture of me so that is where like see there are some input sensors mounted there and then there are some something output uh uh output connected so it and input sensors can be there are a lot of types of input sensors in the uh in the market i have just picked up a few of them there can be light sensors light sensors can be like photo resistors photo photodiodes proximity light sensors there are many other types of light sensors as well then the temperature sensors if there can be like thermistor thermocouple rdds semiconductor type of temperature sensors so there are again the number of uh sensors available to choose from it will depend like what sensitivity you need and what range you want to work on so it it will have its own way of filtering every sensor you will filter out and you will decide like which sensor i i can go ahead with so that that also will have selection criteria which sense temperature sensor you can go ahead you cannot which sensor is of no use for you so you will you you should be very much careful while selecting all these parts then there are force or pressure sensors there are different types of strain gauges are there piezoelectric type of pressure sensors are there inductive capacitive potentiometric their different types of pressure sensors are there position sensors there are lvdt potentiometric again capacitive hall effect all effect sensors rotary encoders so these kind of position sensors are also there so these are these these sensors are based out of some or other uh physical uh principles or theories that we have read throughout our curriculum so this sensor follows some more other physical properties in there same like input sensor there are sensors there are output connected to the devices the outputs can be actuators displays audio signals it can be a motor you can have number of types of motors connected yeah so so you you can just send something and start your motor uh so like say for your washing machine you press some button and your washing machine starts it it starts the motor or some leds lcd is displayed so you have led display lcd displays like i said it's like say traffic signals you have this lcd displays put in in every square which are counting the numbers getting the time for you to put up some alarms or something so you can have different types of output outputs as well and again you can you will have to decide which one you have to go so every time you should be you should be selecting uh your input and output with respect to the properties that you want to come up with you know the properties those are expected so you should be filtering out uh the number of available choices in the market so that that is about the inputs and outputs this those inputs and outputs will be comprising of either of this type of sensors and outputs moving ahead to the memory part of it so now we have touch base about the ios of the microcontroller now we are second important part of the microcontroller is the memory so memory is very vital part you can see on the left hand side i have put in just register cache ram rom eprom flash so this i have just sequentially put down um put up put them up as per the speed of the memory accessing uh that happens so registers being the fastest and flash being the slowest of that of the list and uh up apart from that uh apart from that the memory itself is divided in two different situations volatile memory and non-volatile memory so volatile memory is like the the memory that doesn't retain its data after the power cycle non-volatile memory is the memory that retains its data onto it after the power cycle as well so there are two basic sections into that and again it is different divided into two separate types as well as a primary memory and a secondary memory so in secondary memory you would see that there are magnetic tabs magnetic disk optical disk cd dvd now those you don't you don't find those cds and dvds uh on your quite often on your uh um laptops and desktops you know those are also going off the market flash memory uh you used to still see that there are memory cards pen drives so these are like user mountable memory so those are like secondary memories are user is going to mount it remove it mount it remove it so it is just at the time of usage user is going to handle it primary memory is the memory that is integral part of the system integral part of the system which means it is user is not removing it from the system when it is not in use it is still there in the system uh the application is going to decide if i can use it if i cannot use it or when can you when i need to use it so so within the primary memory we can see again there are there are two sections volatile memory and non-volatile memory so in the non-volatile memory uh it is non-volatile memory is again called as a main memory it has it is a rom promibram all types of roms are there and in the primary part of uh part we can see registers and caches which are very fast quickest of it the quickest of the all the memory uh segments and then uh main memory in the main memory we will we have a volatile types of memories like sram so rom is although non melody memory ram is again a third fastest memory that that is used by the controllers ram con ram can have two types again uh dram dynamic ram and the static ram so basically this is the segregation of the memory memory is utilized with respect to its uh its usage so uh the the on the on on the chip memories are typically utilized by the applications for different configurations program flashing uh like storing some data application data and some calculations so so for that all that purposes on-chip memories are utilized and secondary memories are just for backups you don't run typically typically you don't run applications through pen drive or memory card or from cd dvd you use it for the data backup some video audio contents some text files a huge text file content backup so those are typically used for taking up taking the backups of it and then the primary memories are typically used for different needs of the application so where main application is also main application is flashed or programmed the main application then after starting after at the time of execution it starts utilizing eeprom it starts utilizing ram it starts utilizing registers and caching so that is how the memory is memory is typically utilized so this is all about the memory that comes up with the microcontroller and that can be called that can be connected to the microcontroller so that that was that was it about the memory so now so far we have discussed about ios and memory uh memories uh in the microcontroller the third next point the third very vital part of pirate is about the timing requirements the timer that uh provides us a tick and that is that is where the rtos comes into picture so what is an rtos what is rtos is why why altos is needed if we know like there is an operating system why the real-time operating system is needed so different basic difference between the rtos and the os is operating systems are uh just in just a routine operating system they just carry out their uh operations without assuring the timing of the execution but the real-time operating system will definitely help you to carry out an operation operations with the timing constraints so it will carry out a specific work in given time itself so it is time bound and it is very much time bound so that is very much needed when you are working in the real time real world world you should be you should be constrained to the real real time itself so that is why real time operating systems are into picture that is where those are needed so there are different types of i'm sorry there are different types of scheduling mechanisms are available so in rdos you can have a preemptive scheduling there are round robin scheduling then earliest deadlines first come first serve uh priority scheduling so there are different types of scheduling mechanisms that altos supports each scheduling has its pros and cons it is again it again depends upon uh uh which are those like say when we will talk about the selection of all those this part it will again come into a discussion but then this is again a deciding factor for us to uh to select an autos but preemptive scheduling when we say preemptive like it it is pre it it can prevent anything uh from execution and it can allow something else to execute that is what is a vital criteria a vital feature feature of anarchos so that is uh a part of uh auto scheduling as well so uh there are like say i talked about like four or five types of scheduling which are prominently used in our toes and those are supported by different different types of alters as per their own algorithms again artists what are those helps you synchronize of synchronization of your work synchronization when i say synchronization of the work it is it is like uh uh taking this work synchronously suppose two three components are working together a task is continuously printing some data onto the monitor and for that that task needs to have some data to be entered by a data operator so if someone is entering some characters and the task is taking those characters and putting it in some memory and another task is taking up from there and printing it on monitor now if say this task is continuously reading to the memory and then the typing of the data operator is not that much fast so this sync will not remain it might happen that the task is task is running too short too slow or too fast and it is just typing the same characters again or it is missing some characters so sync has to be there so that is what the rtos is going to give us if a specif if a data operator is typing some characters in the task like scans those characters put that character into memory and give the signal to the other task which is going to put that date copy that data and put onto the monitor so this syncing is handled or this anchoring is facilitated by the rtos so this is just a very simple example that i talked about but there are a number of types of synchronizations and when when we talk about an applications like my mobile phones it is very very complex so uh then then it comes to the what what all tasks and trades and processes so i just test based upon tasks when i was talking about the synchronization tasks or threats or processes are again the units of the code that is continuously getting executed you can keep those execution periods like say for every 10 milliseconds or 100 milliseconds a specific specific set of code needs to be executed that's supposed to something someone is scanning some input keys from the user so it is just that this task will continuously scanning those keys or otherwise uh it can be kept on interrupt base as well typically this kind of application source kept on enterprise but uh the trades keep on executing in that fashion uh though they have their periodic periodicity for execution they have their priorities for the execution they have their own memories allocated and they deal with each other through some or other inter-process communication mechanism that is provided by uh artists so so and uh so so so summarize so so as to summarize it a task or a grade or a process that they have again different context to talk about but if we just talk about tasks two tasks are two set of code executing periodically with its own priority with some memory uh their over memory allocated some on memory for their algorithms to carry out and with the help of some inter process communication mechanism that is developed with the help of artos so that is how uh this whole background is dealt with uh with the help of our dos and then the examples of retouches are again like bx works e cos mqx qnx there are a number of number of artists available in the market again if you go uh to selection of my selection of an artist you also will feel like it's it's just there is a huge number of articles available in the market which i which one i should go so for that you should be you should be knowing like minimum take that is required so so again it is an extension to uh to selection of a microcontroller once you have a selection you have selected your microcontroller you would be selecting your rtos uh so while selecting your artists again you should be understanding the complete system through and through uh because that is going to decide the fate of your application so you should be understanding the complete application so while selecting an rtos you should be knowing like what is the minimum tick that will be required by this application i need a task that should be executing every five milliseconds every time milliseconds every 100 milliseconds if this rtos is providing me the 10 millisecond the tick if this is providing me 5 millisecond tick so typically that that will be your deciding factor types of scheduling we discussed what type of scheduling it is providing it is round robin it is earliest deadline first so data is the deadline for first is like it calculates uh first like who is going to finish up the task finish up the work earlier so whoever is going to finish up the work uh the rtos gives the processor to it and earlier whoever is going to can finish its own task quickly that task gets executed and then the next earlier one is given so uh this is how like earlier deadline first is what first in first out is again you know fifo it is just like official first coffee for only first come first serve so whoever comes in first uh is served first uh but round robin is typically main majority times use round robin is like the every task is given some time allocated and that task x gets executed uh for that much amount of time and it it is done by with the help of time slicing and then the priority scheduling our preemptive kernel uh is also also part of the selection of the artists footprint of artists is very very essential you have to look at it if suppose you have only 512 kilobytes of flash and altos is coming with 300 kilobytes or say like say uh 250 kilobytes of rtos is coming it is half of the memory is getting filled up with rtos so you should be very selective at the time of the selection you have to understand like what memory constraints you have so footprint of altos is very much essential to choose from ram is how much ram that rtos is going to be utilized uh if complete ram itself is going to get utilized for by the rtos i am again out of the memory when i will real i will start writing my own application i will be again out of the memory so so that is also a vital point uh to be think about scalability of the articles is the artist scalable because it might happen like rtos is coming with 50 features but i just need 10 features out of it so i should be able to take only those 10 features i should be able to scale it down i should be able to remove unwanted part and then i should be able to just take what i want to go ahead with so is it is it scalable scalable features are there what all platforms it is supporting which is very much important if a microcontroller i have selected a free scale and the rtos itself is not selecting or not supporting the free skill platform then then that is then you are you are in a mess so uh what all platforms that artos is supporting model debug features are supported because this is once you go into your complex complex and complex programming part debugging becomes very essential and very important part so if it is providing led beginning features uh with it what all types of ipc's i talked i just test based upon while i was talking about the synchronization what all type of inter-process communication it is providing what all types of synchronizations techniques it is providing so it is is it providing semi-force mutex shared memory pipes so there are different uh different types of inter process communications uh available so what all types it is providing to you and then then the last or maybe like say it depends upon where it comes but the cost is also a vital part so decide to decide about the the or the select the r taus so these are again very few part when you go a realistic approach you will find since still 10 more point uh to select an rtos these were just few quick i couldn't i could bring it for you to understand and the importance of selection of microcontroller and an artist how much important that it is"

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"VideoID": "2030",

"Title": "Complete Solar Panel Connection with Solar Charge Controller and Inverter @TheElectricalGuy",

"URL": "https://www.youtube.com/watch?v=HQ4SfbeGg5s",

"Keyword": "Electrical system design",

"Transcript": "friends through this solar panel how we can charge a battery and through this battery how to Glow a bulb I am going to tell you this whole process in this process I will explain you whole connection and which device is used and why it is used I am going to explain you everything in detail the solar panel here power supply from the solar panel cannot be connected directly with the battery we can't do this because the solar panel here through the solar panel we get DC power supply in output and voltage of this DC power supply always varies to charge this battery if we provide high voltage then in this condition our battery may get damaged to charge this battery in a proper way we use solar charge controller to this controller we can directly provide power supply through solar panel if we want to but if you want the whole Connection in a proper way then in between you can use a protection device like this MCB here if you connect this MCB then you will get protection from overload and short circuit besides you must use search protection device also benefit of using this search protection device is if there is any voltage search in output power supply I mean if suddenly there is increase in voltage then in this condition this device will ground the voltage so that all the devices in your home get protected for now I am doing connection of these friends in your solar panel at the back side you will find two terminals on which you have to connect positive and negative wire so I connected these wires and by connecting wires here I provided input power supply to MCB now for connection of this SPD what you have to do this negative power supply here with this Supply Loop a wire and here negative symbol is there so with this terminal connect this wire take positive power supply and connect with positive terminal after this you can see here is earthing terminal so whatever a thing you have in your home connect earthing with this terminal in this way so connection of SPD is completed now what we have to do this MCB here with output terminal of this MCB first of all with output terminal connect one wire and to the solar charge controller at one number terminal here you can see a solar panel symbol is there this side plus and this side minus symbol is there so where plus symbol is there connect this wire with that terminal now from second terminal of this MCB connect one wire and to this charge controller provide negative power supply so we did the connection of solar panel with charge controller now if you want that through this solar panel directly you can glue any bulb then for this what you will do is this charge controller you have in this you will find DC power supply here these two terminals are for DC power supply among these two first terminal is for positive power supply so from this point connect a wire and to this bulb here provide positive power supply to this bulb from second terminal you will get negative power supply so take this Supply and connect with bulb if you do the connection in this way then your bulb will work through power supply from solar panel I mean till the time this solar panel is producing power supply only till this time this lamp you have will glow the moment at which solar panels stop producing electricity your lamp will turn off automatically now suppose this lamp you have if you want this lamp to Glow even when the solar panel is not producing electricity then in this condition you need to use a battery for connection of this battery what you will do here you can see two terminals among these two first terminal is for positive power supply so from this terminal connect one wire and with positive terminal of battery connect this wire now from second terminal connect a wire and with negative terminal of battery connect this wire so connection of battery is also done now through the solar panel the electricity which is produced that will be used to charge the battery and along with this to Glow this lamp power supply of solar panel will be used now suppose this solar panel you have through this electricity production is stopped then in this condition this lamp you have this lamp will glow through the power supply of battery friends in this connection you can see this lamp I used this lamp will operate on DC power supply normally in our home bulb which we use operates on AC power supply we don't use DC bulb if you want to make direct connections then by using DC bulb you can do direct connection but if you want to glue AC lamp then you have to use inverter I used a simple inverter here we also call this inverter as power inverter at the back side of this inverter you will find two cables which is going to be connected with this battery so what I will do from here connect the wires with this I am showing you from here but you can do connection from charge controller or with the terminal of battery you can do the connection now in this inverter you can see a socket is provided through this socket you will get AC power supply so for connection from here to the bulb you need to use a plug top so with this plug top connect the cable inside which two wires are present one wire will be used for phase Supply and another wire will be used for neutral Supply so I provided phase Supply and neutral Supply to this bulb so I connected this bulb with this plug top and now if I connect this plug top with this inverter and this switch here if I turn on this switch then in this condition this bulb here will start blowing friends this connection I shown here in this connection I used only single bulb if you want in place of single lamp you can provide power supply to all the lights in your home what you have to do simply is take this plug top with this power supply and the MCB of your home I mean the MCB for lights connect this with the MCB benefit of connecting this wire with MCB is wherever the power supply is going through MCB in all those places power is supplied through inverter friends if you want to know how many types of protection devices are used in our home then click on the right hand side video thanks for watching this video"

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"VideoID": "2031",

"Title": "Design Problem on transformer selection - Design, Management and Auditing of Electrical Systems",

"URL": "https://www.youtube.com/watch?v=admgAncP4eQ",

"Keyword": "Electrical system design",

"Transcript": "hello everyone let's start with the next topic which is design problem on how to find out the kva rating of a transformer so let's start as you can see the details of electrical load connected to a plant are given below so there are total four loads and for each load the kw value power factor efficiency diversity factor and load factor are given based on the above data we have to calculate the kva rating of transformer and also have to suggest which load requires the power factor correction and size of corresponding compensation of kvr is required to be found out so first we will find out kva rating of a transformer so to find out the kva rating of a transformer we have to find out the kva value of individual loads so the formula is kva equals to load into load in kw into load factor into diversity factor divided by efficiency into power factor so for load one as you can see from the table kw is 800 so 800 into 0.8 which is diversity factor 0.8 which is load factor divided by 0.7 which is power factor into 0.75 which is efficiency so you'll get the kva of load 1 as 975.23 kva similarly we have to get the kva value for other loads so kva value for load 2 is 450 kva for load 3 it is 171.92 kva and for load 4 it is 200 kva so if we sum up all this kva value will get the total kv as 1797.15 kva next is we have to assume future expansion because in future the load on the transformer may increase so it should be capable of handling that additional load so assuming 25 percent of future expansion so taking 25 percent of total kva and we can get the actual value of kva so it is 2246.4 kva now based on this actual kva value we have to select a standard rating of transformer so selecting a transformer of 2500 kva as it is a distribution transformer so it will be delta star connected o n a n that is oil natural air natural cooling will be provided and indoor outdoor as it is a distribution transformer so it will be a step down transformer of 11 kv by 440 volt so uh once we have found out the kva rating of transformer next is we have to find out the power factor correction for which load we require the factor correction so from the given data for load 1 the power factor is 0.75 which can be improved to a power factor of 0.95 which is the highest power factor by connecting a capacitor bank across it so cos 51 is 0.7 lowest power factor cos phi 2 is 0.95 which is the highest power factor and we have to find out the required kvar value reactive power value so the formula is kvar required equals to p into tan phi 1 minus tan phi 2 so we will get the required kvr value as 550 to 52.8 552.8 kv ar next once we get the required kvar value now we have to draw the power factor correction diagram so for load one we have to connect a capacitor across it so as you can see for load one we have connected a capacitor bank across it for the power factor correction that's all for this video and thank you you"

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"VideoID": "2034",

"Title": "Electrical Distribution System Design Intro: 4 | Business Drivers",

"URL": "https://www.youtube.com/watch?v=k9I7sMaPjO0",

"Keyword": "Electrical system design",

"Transcript": "[Music] in summary we talked about the differences between a selectively coordinated system and the differences between fully and series rated systems so when would you choose the two when designing a large multi tenant application consider the customer requirements as well as the National Electric Code requirements if selectivity is a requirement if you're designing for a less critical building maybe a single-family dwelling and cost is more of a preference then we can consider a series rated system you [Music]"

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"VideoID": "2040",

"Title": "Electrical Symbols || Trade Electrician || Shorts || iti",

"URL": "https://www.youtube.com/watch?v=8YnMJMBvpgA",

"Keyword": "Electrical system design",

"Transcript": "foreign [Music] [Music] [Music] [Music] [Applause] through the wastelands through the highways"

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"VideoID": "2050",

"Title": "Harmonics in Electrical Power Distribution Systems",

"URL": "https://www.youtube.com/watch?v=NvuPlntsTpE",

"Keyword": "Electrical system design",

"Transcript": "hello I'm Ryan Downey principal engineer for a vote training institutes electrical engineering division and for this presentation I will be discussing harmonics and electrical power distribution systems the discussion will include in detail the I Triple E standard that explains and provides recommendations and requirements for our monic control also included in the discussion will be the various types of harmonics sources and the cause effect problems they can create and how they can possibly be mitigated please feel free to send me any questions you may have during the presentation I may or may not have time to answer the questions as we go but all questions will be followed up via email here's the little information about me I have over 10 years of experience and electrical engineering I'm currently licensed in 40 states across the u.s. I'm also licensed in Puerto Rico and Alberta Canada I'm an active member of I Tripoli 1584 which is a standard of I Triple E that provides a method of calculations calculating this and an energy of art flash events I am also an active member of I Tripoli 1814 which will be a standard of I Tripoli that will provide recommendations for implementing various types of electrical safety standards techniques into new design projects to improve electrical safety so for our learning objectives we will discuss the following what exactly are power system harmonics what causes harmonics what are the effects of harmonics what standards or guidelines are available to help control harmonics and how can we mitigate our mana so just an overview on harmonics the power quality of electrical distribution systems has a drastic effect on power regulation and consumption our quality includes all aspects of events and the power system that deviates from normal operation which includes our monix this is especially true nowadays with the computer age we live in and there are all sorts of electronic power sources that can cause distortion in waveforms of the power system harmonics are distortion on a power system caused by nonlinear type loads such as variable frequency drives are commonly referred to as VF these large computer systems SCADA systems electronic lighting ballast these types of loads are accounting for a significant portion of the total load for various types of facilities I Triple E standard 519 which we'll discuss a little later assess the requirements for harmonics and creates limits for harmonic distortion I'll also discuss different ways that harmonic distortion can be mitigated so what exactly are harmonics well essentially harmonics are a mathematical way of describing distortion to a way to a voltage or current waveform and you can see here we have a calculus problem which is a Fourier series collision I'm sure everyone is dying to solve however understanding the math is not important it's an it's important to understand the harmonics or a steady state phenomenon and repeats with every cycle harmonics should not be confused with transient dips spikes impulses oscillations or things of this nature also the term harmonic refers to a component of a waveform that occurs at an instant integer multiple of the fundamental frequency harmonic distortion is the degree to which a waveform deviates from its pure sinusoidal values as a result of the summation of all the harmonic elements so for a 60 Hertz fundamental frequency waveform the second third fourth and fifth harmonic components will be a 120 Hertz 180 Hertz 240 Hertz and 300 Hertz respectively also an ideal sine wave should have zero or monic components and you and here you can see what I meant mean by the an ideal waveform having harmonic components the waveform on the left does not have any harmonic components and is essentially a pure waveform with a linear loads linear loads draw a current that is sinusoidal in nature so they generally do not distort the waveform nonlinear loads however can draw current that is not perfectly sinusoidal as shown in the figure on the right since the current waveform deviates from a sinusoidal wave voltage waveform distortions are created as you can see waveform distortions can drastically alter the shape of the sinusoidal waveform however no matter that a level of complexity of the fundamental waveform it's actually just a composite of multiple waveforms called harmonics here we have waveforms that show how the harmonic components combined to form a resultant waveform with much distortion the graph on the Left shows the fundamental frequency waveform combined with that of the fifth harmonic and seventh harmonic waveforms to form the graph on the right and here we have a nonlinear waveform that shows clipping this type of waveform is common in electronic devices having nonlinear characteristics such as computer based equipment when the sine waves are distorted symmetrically about their average values then they're composed of odd harmonics only power is supplied by a three-phase system where each phase is 100 degrees to 120 degrees apart this is done for two reasons first it is because motors and/or generators that use three-phase power or more efficient due to the constant torque the phase of supply second it is because after power supplied to the load the three-phase can theoretically be added onto the neutral wire and cancels each other out this saves the utility company from creating returned wiring to the powerplant however if the three phases contained third order harmonics the currents will not fully head to zero or or cancel out as you can see in the graph that third harmonics between the phases add together which creates oscillate current this results in a sharp increase in the zero sequence current which increases the current in the neutral conductor this effect can require special consideration and design of an electric system to serve nonlinear loads to avoid third harmonics adding together Delta connections are used and the current is cycled around the connection instead of a Wye connection most harmonic problems are caused by the third harmonic for the most part harmonics were abstinance of the 1960's with a coming of age in computer systems and electronics when the beginning of this area harmonics began to surface as I mentioned harmonics are caused by a nonlinear type loads power sources act as nonlinear loads and draw a distorted waveform that contains harmonics 75% of all electrical devices in North America operate with nonlinear current draw so here we have a list of devices or components that can cause issues with our monix as I mentioned variable frequency drives or VFDs universal power supply systems are commonly referred to as UPS systems DC converters solid-state rectifiers arc welders heater units or furnaces a switch mode power supplies such as those used on computers electronic lighting ballast PLC systems SCADA systems computer systems all of these are sources of harmonics so let's talk about the effects of harmonics hour- can have detrimental effects on electrical equipment and power systems unwanted distortion can increase the current in power systems which results in higher temperatures and neutral conductors and distribution transformers hour- can also cause the overheating of transformers motors generators capacitors cables of conductors etc which can result in premature failure harmonics can also cause miss operation of circuit breakers and other types of protective devices as well as malfunction of electronic equipment harmonics can also result in an infant or incorrect readings on meters which can cause a whole set of other problems and can also cause malfunction and instruments including medical instruments which can obviously have serious consequences going on with the effects of harmonics harmonics can also result in premature failure of power supplies due to distortion of the power of the supply voltage harmonics can also result in a low power factor requiring the transformer to be upsizing KVA or neutral emphasizing harmonics can also cause resonating and heating of power factor correction capacitors which can cause failure the power quality of distribution systems has a drastic effect on power regulation and consumption another phenomena that related to harmonics that can occur is system resonance resonance occurs when a harmonic frequency produced by a nonlinear load closely coincides with a power system natural frequency the likelihood of effects from harmonics occurring greatly increases if a resonant condition exists or occurs the single largest cause of severe harmonic distortion is resonance a normal harmonic may be amplified ten to twenty-five times if resonance occurs at or near critical frequencies resonance occurs mainly due to improper use of power factor correction capacitors or because of incorrect application of filters there's two forms of system resonance parallel resonance and series resonance and we'll talk about those so parallel resonance occurs when the system and inductance reactants noted here on this drawing minus XL and the capacitance rear reactants noted as XZ are equal at some frequency like the fifth seventh etc harmonic currents that flow between capacitors and the system inductance are significantly amplified typically up to 10 to 15 times parallel resonance can lead to capacitor fuse blowing or failure and/or transformer overeating so series resonance is a series combination of inductance and capacitance it creates a low impedance path for harmonic currents at the natural frequency this results in high harmonic currents through the capacitors series resonance can result in a high voltage distortion level between the inductance and capacitance so I Triple E standard 519 was created to establish limits for our mounting distortion and provide direction on billing with harmonics it was intended to provide direction on dealing with harmonics introduced by static power converters and other nonlinear type loads the standard was written to establish goals for the design of electrical systems with both linear and nonlinear loads it is presented as a guideline for a power system design when nonlinear loads are present and assumed steady state operation distortion limits for both current and voltage are defined in order to minimize interference between the electrical equipment the limits are defined at the point of common coupling which I will discuss the standard is titled recommended practice and requirements for our monic control and electrical electric power systems and the current standard was released in 2014 so the point of common coupling it's defined as the point in the power system closest to the user where the system owner or operator could offer service to another user frequently frequently for service to industrial users for example manufacturing plants via dedicated service transformer the point of common coupling is at the high voltage side of the transformer for commercial users that are supplied through a common service transformers the point of common coupling is typically at the low voltage side of the transformer the point of common coupling is basically recognized as the point where any harmonics can migrate onto the utility system and cause problems for other customers so here we have a couple of diagrams of the location of the point of common coupling and you'll note you'll notice how the it's basically the point of common coupling is basically the point at which another customer could be served so you can see the different types of scenarios we have so more on the point of common coupling the intention of having the point of common coupling is to prevent a high level of harmonics such as that generated by nonlinear loads generated by one customer from causing distortion at another customer on the power grid in considering the primary site of a transformer that supplies only one customer the transformers impedance will decrease the short-circuit ratio this results in an increase in the harmonic current limits the voltage distortion will be higher at the secondary of the transformer so going over some of the definitions we have in I Triple E 519 standard the short-circuit ratio is the ratio of the short-circuit current available at the point of common coupling to the maximum fundamental load current this ratio essentially shows a relative size of the load compared to the utility system the maximum load current is recommended to be the average current of the maximum demand for the preceding 12 months unfortunately this value is inherently ambiguous making it difficult to derive at the design stage when measured load is not available so looking at this graph this shows a high short-circuit current and which results in a minimum voltage distortion and you switch over to this next slide and you compare and on this graph you can see the low the low short-circuit current which results in a significant voltage distortion the distortion is much more pronounced as we saw than the one on the previous grass so here you can see the larger loads have a greater ability to cause voltage distortion on the utility system and now let's discuss more of mathematics here we have the equations for total harmonic distortion and total demand Distortion these equations can be used to describe a voltage or current Distortion the total demand distortion equals the total harmonic distortion multiplied by the ratio of nonlinear load to the total demand load which includes both linear and nonlinear loads per the I Triple E is 519 standard these equations consider components up to the fiftieth order however I'd like to note it also notes that the components of order greater than 50 may be considered as necessary more definitions here the voltage total harmonic distortion of the waveform is the ratio of the root sum square value of the harmonic content of the voltage to the root mean square value of the fundamental voltage similarly the current total harmonic distortion of the waveform is the also the ratio of this root sum square value of the harmonic content of the current to the root mean square value of the fundamental current so these formulas show the total harmonic distortion on a signal the end result is a percentage comparing the harmonic components to the fundamental component of the signal the higher the percentage the more distortion as present on the signal will discuss harmonic limits since managing harmonics in a power system is considered a joint responsibility involving both the supplier and the end-users I Triple E 519 places recommended harmonic limits for both voltage and current the recommended values are based on the fact that some level of voltage distortion is generally acceptable and both parties must work together to keep actual values within acceptable levels by limiting the harmonic currents by users the voltage distortion can be kept within acceptable levels I try triple e 5:19 also states that the recommended limits only apply at the point of common coupling and are not to be applied to individual pieces of equipment or at location within a user's facility in most instances the harmonic voltages and currents that these locations can be found to be significantly greater than the limits at the point of common coupling due to the lack of cancellation or other phenomena that tend to reduce the combined effects of multiple harmonics sources so this is a table one that's in its in a I Triple E standard five nineteen twenty fourteen as we as we can see here that establishes the harmonic limits on voltages as eight percent for total harmonic distortion and five percent of the fundamental voltage for any single harmonic this is for system levels up to a thousand volts and on this table you can see the limits for system levels between a thousand volts and up to sixty nine thousand volts have harmonic limits on voltage as five percent for total harmonic distortion and three percent of the fundamental voltage for any individual harmonic you'll also notice it shows limits for voltage levels up to 160 1000 volts should be noted that even if the voltage distortion limits are met at the point of common coupling they could very easily be exceeded downstream where connected equipment could be affected since the voltage distortion as a result of our mana currents passing through the impedance of the power system voltage distortion is always higher downstream where the harmonic currents are generated and where system impedance is the highest now let's look at the current harmonic distortion limits for power systems with voltage levels between 120 volts and 69 thousand volts the limits can be found in table 2 of the standard which is shown here I would also like to note that tables 3 & 4 which are not shown here show their current and distortion limits for higher system voltages the table defines total demand distortion current limits as well as individual harmonic current limits the limits are most severe for short circuit ratios of less than 20 because this lower ratio indicates a high impedance power system or a large customer or both voltage distortion is more likely to develop from current harmonics consumed at a point of common coupling where the short-circuit ratio is low there thereby justifying the more severe limits so discussing further the current harmonic distortion is recommended that the limits be increased by a multiplying factor when actions are taken by the user to reduce low order harmonics and as we can see in this this is table 5 the multipliers in the second column are to be used when steps have been taken to reduce the harmonic order shown in the first column please know however that the low order harmonics currents must be kept below 25 percent of the current harmonic distortion values shown in table 2 so power factor must include the distortion factor to account for harmonics so here we can see how the distortion factor is determined the distortion factor decreases as our monix increases true power factor may be lower when the effects of harmonics are considered so here we have a couple of graphs the graphic on the left shows a typical power factor diagram and the graph on the right shows a power factor diagram with harmonics included you'll notice how the harmonics are factored in to the equations as well real power is useful work producing power reactive power is on useful non-work producing power as an example imagine you have a full glass of beer the foam at the top is not very useful just as reactive power however the beer below that is very useful just as real power so the class of example of a nonlinear load is a rectifier with a capacitor input filter where the rectifier diode only shows first excuse me only allows current to pass to the load during the time that apply voltage exceeds the voltage stored in the capacitor which might be a relatively small portion of the incoming voltage cycle the characteristic current harmonics produced or determined by the pulse number and here you can kind of see the equation so here's an example of a six-pulse rectifier with harmonics present you'll notice how the fifth seventh eleventh 13 17 19 and so on are monix are present the current is quite distorted and the typical full load current harmonic distortion at the transfer transformer primary can be anywhere but from 25% up to 48 percent depending on the network impedance even with a three percent reactor and here we have an example of a 12 pulse rectifier with harmonics present you'll notice that the fifth and seventh harmonics are not present as we saw in the six pulse rectifier the typical full load current harmonic distortion at the transformer primary is between 8% and 12% and here we have an example of an 18 pulse rectifier you'll notice that the 11th and 13th harmonics are not present as we saw on the 12 pulse rectifier at the typical full load current harmonic distortion at the transformer primaries between 4% and 6% this shows the effect of increasing the AC input percent impedance on the input current harmonics the six pulse rectifier cannot reduce the input current total harmonic distortion below 25 percent even with an input AC reactor with 10 percent impedance and you can see that the 12 volts and 18 post rectifiers can achieve an input current total harmonic distortion of less than 10 percent with the addition of an input AC reactor of 1 to 2 percent impedance so as we have seen 12 posts or better yet 18 post drives are preferred over 6 pulse drives due to the reduction of harmonics as a rule of thumb the magnitudes of the harmonic currents will be the fundamental current divided by the harmonic number for example the magnitude of v or money would be one-fifth of the fundamental current VFDs also producer Munn occurrence at the output of the inverter which are seen by the motor so let's talk about harmonic mitigation with the increasing demand of nonlinear type of equipment and loads mitigation of harmonics becomes more and more important if harmonic study or testing indicates excessive harmonic levels or a potentially harmful resonance condition mitigation must be considered depending on the specific situation there are often several different methods to look into for mitigating the harmonics so what are some of the methods we can utilize to mitigate the harmonics well of course we could limit the amount of nonlinear loads but this is typically not an option with the necessity of these loads with limited resources line reactors and motor drive isolation transformers use reactive harmonic attenuation effect to reduce the actual current distortion at the input terminals to the drives line reactors are more commonly commonly used because of their size and cost as we discussed earlier we could replace six post drives with higher pulse drives such as twelve posts or 18 post drives harmonic filters can be used to mitigate problems as well they are used in applications with a high nonlinear load to overall system ratio to eliminate the harmonic currents they can be tuned to specific harmonic such as the third fifth seventh eleventh etc to meet the requirements of the I Triple E five nineteen standard active filters in certain negative harmonics into the network thereby eliminating the undesirable harmonics on the network passive filters are a combination of capacitors inductors or reactors and resistors they're the most common and are available for all voltage levels a resonance problem indicates removal or relocation of power factor correction capacitors overall it's important to understand how the various system components interact with each other and with the power system it is essential that a coordinated solution be provided which meets total harmonic distortion levels system performance demands and power system requirements correcting or mining distortion problem in the field after installation can be very challenging time-consuming and very costly so now I'll go over a few of the different filter types available for harmonics mitigation harmonic filters can be used to mitigate harmonic problems as well they generally consist of one or more tuned inductor inductor capacitor legs which specific harmonic currents away from the power system they also offer that it benefit of supplying leading reactive power and thus provide power factor correction here we have an active filter front end with a LCL filter the active filter line and removes low frequencies less than one kilohertz the SEL filter which you can see all this on the diagram LCL filter is a passive filter removes high frequencies greater than one kilohertz current and voltage the SEL filter is inserted between the rectifier and the three-phase power supply this attenuates the full Smith width modulation harmonics so the proper voltage and current total harmonic distortion levels are obtained for this particular setup no transformer is required and performance is actually not affected by line imbalance a parallel active filter is an option to help mitigate or monix it works by sampling the distorted current and uses fast-acting transistors to generate harmonic currents and inject them 100 degrees 180 degrees out of phase the pros of using these filters are their size - harmonic content only they maintain good performance at light loads the cons of using these filters are they're expensive they're susceptible to background voltage total harmonic distortion and imbalance also the complexity requires start-up and regular service by the manufacturer another option to help mitigate harmonics is to use a VFD with an active front-end or also known as an active rectifier the six pulse diode bridge rectifiers replaced by a fully controlled transistor bridge the pros of using this device are it ideally achieves the lowest current total harmonic distortion it can provide regenerative regenerative braking the cons of using this device are it is expensive it can introduce higher order harmonics and it can result in higher electromagnetic radiation as well the complexity requires start-up and regular service the manufacturer so here we have an overview of the effectiveness of different types of harmonics mitigation methods no mitigation can typically result in a 72% total harmonic current distortion that's what doing nothing the percent harmonic reduction is based on the current total or a harmonic distortion for a given method as compared to no mitigation at all so looking down the list you can see how different methods are more effective than others so harmonics can also be measured or monitored using specific metering equipment a digital oscilloscope shows the wave shape total harmonic distortion and amplitude of each harmonic a true RMS Multi multi meter gives correct readings for distortion free sine waves and typically read flow when the current waveform is distorted the instruments used to measure harmonics should comply with the IEC specifications which are detailed in I Triple E v 19 2014 standard their requirements for the measurement window in cycles to properly display the spectral components there are also requirements for measurement of harmonics over daily and weekly observations so it's important to check the I Triple E 519 for these requirements so harmonics and analysis is a mathematical way of simulating or predicting harmonic distortion levels and potential resonances based on the power system data the electrical distribution system is modeled using proven engineering software and harmonics analysis performed in conjunction with other power systems analysis such as short circuit analysis etc it is recommended that the analysis be performed by definitely should be performed by a qualified person preferably a licensed electrical engineer also mitigation myth can be analyzed to determine the effects of adding different types of equipment to limit or eliminate the harmonics so when should a power distribution system be monitored or evaluated for harmonics well it is it is always best to perform an evaluation of harmonics during the design stage this is very true if large capacitor banks which are typically used for power factor correction or other harmonics generating equipment will be used also if capacitor banks will be incorporated into an existing system harmonics analysis or evaluation should be considered especially if 20% of or more of the load includes other harmonic generating equipment it is recommended that a harmonic analysis and power system modeling be performed in the event that large nonlinear loads will be added to a large facility especially if the new loading comprises twenty twenty-five percent or more of the existing load if the facility has a history of harmonic related problems such as brownouts voltage flicker capacitor fuses being blown or some of the other things I previously mentioned an evaluation should definitely be considered so in conclusion harmonics can result in decreasing power system reliability understanding the causes potential effects and mitigation methods can reduce or eliminate our Monica type problems mitigation should be considered if nonlinear loads are significant portion of the total system load which we went over also in conclusion applying the harmonic limits for I Triple E 5:19 can be challenging and it's important to understand the requirements mitigation methods can be determined with a proper harmonics analysis it is recommended that the harmonics analysis be performed by qualified personnel and it is essential that a coordinated solution be provided which makes the total harmonic distortion levels system performance demands and power system requirements and that concludes the presentation once again I appreciate your time and I apologize if I was unable to answer any other questions however I will follow up with an email to each and every questions that were submitted and thank you"

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"VideoID": "2054",

"Title": "DIY Camper Electrical System Cost?",

"URL": "https://www.youtube.com/watch?v=Tkbj51mOhKg",

"Keyword": "Electrical system design",

"Transcript": "- Last week, we released a huge start-to-finish installation video of our 24-volt electrical\nsystem in our transit. This week, I'm gonna talk\nabout the cost of this system, some of the design choices we made, and answer a few questions\nthat we got about the system. So let's jump into it. For this electrical system,\nwe installed two-270 amp-hour Battle Born GC3 Heated Lithium Batteries and wired them in series\nto create a 24-volt system. The most common question we got was why did we choose a 24-volt system? And the answer is pretty simple: because we've never done a 24-volt system on this channel before, and we get a lot of questions about them. But, another reason we\ndecided to do a 24-volt system is because with a 24-volt system, we could use much smaller wire, which reduced the costs\non the system overall. For example, the battery bank wiring kit for two batteries wired in parallel with 4/0 wire costs 49.99 for the appropriate amount of\nwire, lugs, and heat shrink, whereas wired in series, we could use 1/0 wire\nand less connections, and that kit costs 14.99. That's a pretty big difference already! And that's definitely\nsomething to consider when designing your electrical system. Altogether, this system cost $12,060. Now let's break that down. Our EXPLORIST.life complete\nkit for this system, as shown on our website, totals $4,695. That complete kit\nincludes all of the wiring and components needed for\nthe electrical system, except for the two-270 amp-hour\nBattle Born GC3H batteries at a cost of $5,018 and the Victron MultiPlus 24-volt\n3000-watt Inverter/Charger at a cost of $1,388. We recommend purchasing these items directly from Battle Born, as they will program your inverter/charger for your specific battery bank. In addition to the major\ncomponents and wiring, we spent: $722 on the electrical enclosure, $50 on the external solar port\nfor our ground deploy array, $24 for an HDMI extender\nto reach from our Cerbo GX all the way over to our GX Touch 70 that's mounted on the\nother side of the van, $0 on the wood that we\nmounted the batteries to, as it was scrap left over\nfrom another project, $63 on L-Track hardware\nto mount the enclosure to the L-Track on the floor. And I'm throwing in an additional $100 for miscellaneous shop supplies such as zip ties, grommets, screws lost to the abyss, et cetera. All of that together is $12,060. What's not included in this figure is all of the branch circuits and their associated components. I wanted to keep this\nas simple as possible, so we'll cover those in\nour full cost breakdown once the van is complete. We also didn't include a\nground deploy solar array, as we haven't purchased or\ndecided on the panels for that. We did, however, include the solar panels and all of the wiring to install the array that we have on the roof of our transit. We also didn't include alternator charging because at this stage, we are still waiting on parts availability so that we can have super\nfast alternator charging. We anticipate that to\ncome later this year. Building an electrical system also requires quite a few specialty tools that most of us wouldn't have on hand if we hadn't already done an\nelectrical installation before. These tools are outlined in a video that we did a while back, and we'll link that in\nthe video description. But these tools include: wire cutters, diagonal\ncutters, flush trim cutters, wire strippers, a cable knife, ratcheting insulated terminal crimper, a ratcheting uninsulated terminal crimper, a lug crimper, ferrule\ncrimpers, a heat gun, a multimeter, and an AC voltage detector. In total, these add up to about 600 bucks. You'll also need some standard hand tools like sockets and ratchets,\nscrew drivers, wrenches, a drill, and an impact driver. I'm not including those\nin the cost, though, as I'm making an assumption that most of us DIYers already\nhave these tools on hand. So this brings our total cost of the system so far to $12,660. But, the last component\nof our cost is our time. Or rather, Nate's time. I asked Nate to give his thoughts on about how long this\nproject would've taken if he hadn't been filming\nand re-doing sections over and over for the sake of the video. We determined that a proficient installer that has all the components on hand and knows their way around the system would take about a week\nto install this system, including building the enclosure. A novice, on the other hand, would likely need to take about two weeks to install the system, giving plenty of time for mistakes and, most importantly,\nreading all of the manuals for the components. All in all, we have a heck\nof an electrical system installed for $12,000 plus\nabout a week of Nate's time. I'm pretty happy with that cost, honestly. We now have a high-performing\nelectrical system with all the bells and whistles that we could possibly want. Well, except for alternator charging; that will come soon, I hope! Now, a quick note for y'all on installations and\nprofessional installers. We know that not everyone\nwants to invest in the tools and the time to install\ntheir own electrical system, and we completely sympathize with that. Electrical systems are\ncomplex and can be scary. Since we unfortunately\ndo not have the time to add installations to our services, we recently launched an EXPLORIST.life Certified\nInstaller Network. What this means is that\nwe have fully vetted each installer on this list and have approved them to\ninstall our system designs. You can find this list on our website at EXPLORIST.life under\nInstallation Services. I'll also note here that\nany installer out there that is offering our systems\nand is not on this list is not only infringing on\nour intellectual property and breaching our download policy that explicitly states that these diagrams are for personal use only\nand not commercial use, but also, and perhaps more importantly, they're using our information that we put out there\nfor you guys for free so that they can build a\nbusiness around our information. This does not support the free content that we make available to all of you. Maybe don't go with an installer who is unethical enough to rip off our intellectual property. Who knows what else\nthey're cutting corners on. Okay, enough of my rant! I really hope this video was helpful in letting you analyze the\ncosts of an electrical system. Let me know in the comments if you have any other questions\non the cost of this system, or if I left anything out. See you next week!"

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"VideoID": "2055",

"Title": "Electrical distribution systems",

"URL": "https://www.youtube.com/watch?v=HdhoWwghrj4",

"Keyword": "Electrical system design",

"Transcript": "hi thank you for joining us for the consulting specifying engineer webcast electrical distribution systems sponsored by abb cyber sciences and starline a brand of legrand i'm your moderator amara razkas with consulting specifying engineer and cfe media and technology and i'll be with you for this hour-long education session let's learn about this platform if you're having trouble with your slides or with the sound please refresh your internet browser or click on the refresh media button directly under the presenter's photo you can control the volume settings by adjusting the volume on your own device if you're having technical problems click on the question mark at the top right corner of your screen to do some system checks before contacting an online technician if you do need help please type a message into the ask a question box and will respond in the answered questions box to download this presentation use the event resources on the left side of your screen type questions for the presenters in the ask a question box on the left side of your screen you may ask questions at any time during the presentation the q a portion will start in about 45 minutes if you're interested in receiving one aia ces approved learning unit for this event you need to pass a 10 question exam to take the learning unit exam and to download your aia ces certificate use the learning unit exam tab at the top of your screen the quiz will open in a new browser window so i recommend you open that tab right now it will break when the webcast signs off in keeping with the aia institu american institute of architects continuing education system policy please take a moment to read the quality assurance slide here are the learning objectives we'll talk about these in today's presentation please note that any red underlined text you see is a hyperlink in the pdf where you can get more information let's now hear from our sessions sponsors at the conclusion of the commercials you may experience a few seconds of silence to make up for mixed internet speeds please stay tuned after the videos for today's presentation for critical facilities always on reliable power is essential power outages can be costly as well as damage your reputation and can lead to increased liabilities and non-compliance issues no matter how well designed no system can operate indefinitely without failure when something goes wrong you need answers and fast at cyber sciences we provide precision timing for accurate event recording helping minimize cost and time of recovery after a power event precision timing is essential for event reconstruction and post-event analysis in complex electrical networks state changes can occur quickly thus system-wide clock synchronization is needed for meaningful data analysis with products made in the usa and available worldwide cyber sciences provides accurate event recording down to one millisecond cyber sciences the world leader in critical power loss event recording [Music] starline track busway t5 series ranges from 250 up to 1250 amps the busway runs overhead and provides power to server racks in mission critical environments and to machines and equipment used in assembly and manufacturing with track busway you can connect power at the point of use and easily rearrange for future changes and expansion plug-in units can be engineered to order and are interchangeable on any t5 system our patented u-shaped copper bus bars ensure the most reliable connection on the market for more information on the starline track busway t5 series please visit starlinepower.com [Music] we know that safety is always a top priority are you keeping up with the innovations helping to make safer power distribution possible from the largest piece of arc resistant switch gear to the smallest arc fault and ground fault sensing circuit breaker abb is designing ways to help lower the risk of harm to both people and equipment a forgotten tool inside the enclosure is a common cause of arc flash reduce the risk of a tool coming in contact with the bus stack or breaker connections with abb's ip20 certified bus stack help enhance operator safety with groundbreaking t-max xt circuit breakers remote metering and monitoring allow users to access information anytime anywhere with support for over ten communication protocols you'll always be connected to what's happening in your power distribution system optional bluetooth connectivity allows personnel to set parameters and check measurements directly from their smartphone all from an arc free zone accessories like reduced energy let through modules help to further enhance operator safety and surge protection devices and advanced voltage and frequency protections can help prevent power quality issues from damaging sensitive equipment as well work safer and protect your assets with innovative design [Music] all right well we have lined up two extraordinary presenters today john yoon is the lead electrical engineer at mcguire engineers in chicago his expertise in the field of electrical engineering is the product of more than 20 years of experience in the design of electrical distribution systems emergency systems and lighting design john is a member of the consulting specifying engineer editorial advisory board jeff thomas is vice president and business group director with lockwood andrews and nunem based in houston he's an electrical engineering expert with 28 years of experience as a project manager energy manager auditor and certified healthcare instructor all right gentlemen john you're up first let's get started thanks amara for so for this webinar we're starting out with an excerpt directly from article 90 the introduction to national electrical code the stated purpose of the code is to safeguard people and property from the hazards associated with the use of electricity so when we design electrical distribution systems the typical focus is on ensuring that the equipment and wiring methods that we specify have appropriate capacity and configuration to reliably store whatever loads may be connected to that system however what we often lose sight of is the fact that there are inherent hazards associated with the use of electricity ultimately when we design electrical distribution systems we need to be able to interrupt the unintentional flow of electrical current before it can cause harm to people or damaged equipment for being at this webinar let's start with the base how do you characterize what that unintentional current is so when we talk about unintentional unintentional or objectional electrical current we're typically talking about overloads and faults these two are distinctly different things let's first take a look at what the concept of an overload is the nec definition is shown on this slide you can read it yourself but based on this definition of faults such as a short circuit or a ground fault isn't an overload if you read into this the key takeaway should be that the current is flowing through the circuit it is flowing through the circuit that you designed through that normally expected path whether it be through a transformer a motor a feed or whatever load or wiring method you may have connected to that circuit however the magnitude of that current is more than what you want it could be sustained locked order current associated with a seized motor too many appliances plugged into a circuit it could be any number of things faults or short circuits on the other hand are where current flows through a path other than the intended load or circuit oddly enough the nec doesn't formally define all types of general faults or short circuits only ground files are defined within article 100 the ground fault definition is indicated on this particular slide that you can read yourself give you a second to take a look at it and let's move on to the next one so that brings us to the question we have two different types of conditions overloads and faults how do you safely interrupt this abnormal flow of electricity um with an overcurrent protection device but let's continue with another excerpt from the article 100 definitions the definition for an overcurrent protection device that's on the slide so what qualifies as a over current protection device this could be a fuse it could be a multicast circuit breaker could be a protective relay whatever however what isn't notice noted here very conspicuously is a timing requirement how quickly that device needs to operate while the code in some cases makes mention how quickly a device needs to operate under very specific conditions it generally is more a function of the ul standard associated with that particular device type moving on to the next one let's start with fuses fuses have been around for an extremely long time the picture that you see in this particular side is part of a 5 000 amp 208 volt switch live front switchboard from the 1940s you can clearly identify the individual fuses fuse clips that they're seated and everything else although it seems wildly obsolete and unsafe this switch was is actually still in operation so even though fuses have been around for what seems like forever there's no no formal definition within the nec for what a fuse is as such we have to rely on definitions from another source there are two applicable standards for fuses ul 248 and nema fu1 let's start with the nemo definition a fuse is a protective circuit that opens the circuit during a specified overcurrent condition by means of a current responsive element that element is the fusible portion of the of the fuse that melts during an overcurrent condition to clear the circuit basically that's a sacrificial conductor that melts maybe even vaporizes depending on the magnitude of your current when exposed to an over current condition it opens the circuit and prevents damage to those downstream devices so let's take a closer look at how a fuse works under normal operating conditions that element has reasonably low resistance so it is functionally no different from any other conductor however in an abnormal operating condition we depend on a sacrificial element we either have to melt or vaporize an element to open and interrupt the circuit if that happens in free air the act of melting an element and releasing that energy that in of itself could be potentially dangerous as such we have to somehow contain or dissipate that energy so that element is installed within that cartridge body that you see in the picture and it's usually surrounded by sand to contain and dissipate that released energy to quench any arc that's formed uh traditional single element fuses are compromised either protecting against short circuit or protecting against an overload condition you can design that single element to melt very quickly and have it be very fast acting or you can sacrifice the speed and have it be a time delay type fuse but this is a pretty significant trade-off and is unacceptable when you're trying to protect loads of very high inrush currents like motors and transformers to address this issue the fuse industry came up with the concept of a dual element fuse now that's exactly what it sounds like you have two separate elements connected and series together one optimized for the low magnitude over current condition and the other for the high magnitude fault condition the vast majority of fuses that you encounter in low voltage power distribution systems will be of this dual element type moving on so let's move on to how the element in the fuse reacts to various magnitudes of over current based on what we've seen so far you should be getting the impression that these overcurrent protection devices will react very differently depending on how much current they see whether it's a minor overload or vaulted bolted faults on the other side of the spectrum to be able to compare two different types of overcome protection devices something that's called a time current curve all manufacturers have these and they're off of similar formats so you can make easier comparisons between the two between two different devices if you look closely at this graph you notice that the scales aren't linear this is a log log graph so our per unit values go from 0.1 to 1 to 10 to 100 and so forth and so on and these time current curves time in seconds is always on the vertical y axis and current in amps is on the horizontal x-axis and this particular time current curve is for a generic hundred amp fuse the red band that you see here represents the minimum and maximum melt times for the elements in that fuse everything to the left of that curve is normal operating conditions and the fuse will not open once you hit the red band or go to the right of it the fuse will open the circuit so sorry right so you can see that that thin red band uh it has some weight to it this is due to manufacturing tolerances so the fuse is guaranteed to open somewhere within that band not necessarily an exact number but somewhere in that band you can also see if you follow the graph up to time scale towards the top at 200 this at the 200 second mark if you cross-reference that with current you can see that the fuse actually holds substantially more current than 100 amps for that period of time uh before we leave this on let's take a look at the bottom of this curve and you can see where we have a very high magnitude of current how the fuse reacts in a fall condition this will become more important when we're comparing these as circuit breakers let's move on to circuit breakers now um again we have another definition from the ndc that you can read based on this definition a circuit breaker can be open and enclosed against all magnitudes of current up to its short circuit rating basically acting as a switching device the ul standard applies to most common types of circuit breakers molded case circuit breakers ul489 again the nec doesn't necessarily dictate how quickly a device must interrupt that abnormal flow of current that requirement is defined by that ul standard one important point is that when ul test circuit breakers are tested for their rated opacity and free air when they're installed within an enclosure unless they are specifically rated for 100 duty they must be derated to 80 when subjected to continuous current continuous currents are defined in the nec for any load that is sustained for three hours or greater okay let's move on to the next slide and talk a bit more about this again we have two distinct conditions that we're trying to protect against overloads and faults these two conditions are characterized by the magnitude magnitude of unintentional current you know there's a big difference between these two we saw how a dual element fuse addresses these two conditions but the question is how does the circuit breaker address those same two conditions a breaker does this by two distinct mechanisms a thermal function and a magnetic function the thermal function is accomplished with a bi-metal strip the bi-metal strip is two interconnected pieces of metal and these two pieces of metal have slightly different coefficients of thermal expansion they will shrink and expand at different rates when heated you know like resistive heating when you have current flowing through them this causes the descriptive to bend and release a latch to trip the circuit breaker open the magnetic portion of the breaker works on the principle of electro electromagnetic fields created by the flow of current the right hand rule the magnitude of the field is proportionate to the magnitude of current through designing the breaker you can create a magnetic field that will force a switching armature open more current means greater magnetic field which will open the contacts much faster when subjected to full fall current the tip the typical circuit breaker will open in a half to one cycle when we look at time current curves a bit later um this will become a little bit more apparent so this is a a picture of what we just described we have the bi-metal element that handles the overload side of it we have a magnetic element that handles that short circuit part of the equation um and like they say a picture is worth a whole thousand words hopefully this makes things a little bit more cl a little bit clearer and when you think about it it's almost like a mousetrap once you trip that latch the spring will draw the circuit breaker o and either the magnetic element or the bi-metal element can't trip that latch so let's move on to how a thermal magnetic circuit breaker responds to various magnitudes of overcurrent here's a time current curve for a generic multicase circuit breaker again we have a log log graph of this uh of this device response of various overall current the blue band that you see represents the minimum and maximum melt minimum maximum trip throughout the controls for this breaker everything to the left of the curve is normal operating conditions the breaker will not open and again some are too fused with everything on the right side of it it will open and interrupt the circuit however you can see that blue band is much wider than the fuse we were looking at before the the breaker is guaranteed open somewhere within that band but there's a lot more uncertainty regarding exactly where uh finally at the base of the time current curve we see that instead of a smooth curve at the bottom we have a weird dog leg at extremely high current basically a level current that you would typically expect with something like a bolt fault you can see that responsive extremely fast again half to one full cycle but that blue area extends out to the right now we have a certain level of uncertainty all ul 489 breakers have this characteristic dog-like in the instantaneous region which can become a selective coordination issue with some types of solid state trip units for circuit breakers you can adjust the pickup setting but if the breakers ul listed under 489 it cannot be defeated only adjusted again the equipment downstream of this that you're trying to protect with these breakers is typically only rated for three full cycles of fault current moving on now with a fixed mechanism like that for generic fuses circuit breaker we have pretty well defined characteristics regarding how each device will respond to magnitudes of over current but in an electrical distribution system we have multiple devices in series each with its own characteristic time current curve when we design electrical distribution systems we're trying to isolate an abnormal condition to the smallest portion of the distribution system we want the device closest to the fault or overload to operate first to have what we call selective coordination with multiple devices in series there's bound to be some overlap and we'll lend some uncertainty regarding what device will trip first given the various types of scenarios that you may encounter being able to tweak or make minor adjustments to how that individual breaker reacts to certain conditions can make all the difference in the world uh to this end some breakers can be provided with an electronic trip unit with electronic trip units we're replacing a purely mechanical tripping mechanism like in that picture with an intelligent module that senses the true rms current flowing through it with current transformers depending on the breaker you can shape or tweak multiple portions at a time current curve these trip units sense over current conditions very quickly but you're limited by the fact that it still has to operate a mechanism to open the circuit uh see we're a little shorter on time let's keep on moving a little bit faster um so we talked about both fuses and circuit breakers let's directly compare to operate operating characteristics of the two of course there's a credible variety of fuses and circuit breakers each with its own specific time current curves however to illustrate a point let's look at that generic fuse and time and circuit breaker time current curves this picture is a direct overlay of both of these the fuse is red the circuit breaker is blue when they are overlaid the difference is quite pronounced you can see that the characteristic transition between the magnetic function and the thermal functional in the blue band is at about half a second or 30 cycles we can also see that in this particular case the circuit breaker racks considerably faster in the overload region of the graph at the top however when we take a look further down in the short time region of the graph where the magnetic or the magnetic function of the breaker operates there's pretty high uncertainty regarding where the circuit breaker will clear the fault in comparison to a fuse if we go down to the bottom of the graph again see that dogleg that's characteristic of a thermal magnetic breaker that top of that dog leg is at one cycle .0167 seconds the circuit breaker can trip anywhere within that shaded blue region whereas with the red band representing the average melt time for the fuse is really well defined in this region so down there i can't tell you if the fuse or circuit breaker is going to catch first all right there are some people that prefer fuses there are people that prefer circuit breakers so everyone has their own personal preferences however we're not here to say that fuses or circuit breakers are better and worse rather than rather basic in your particular application you should understand relative advantages advantages of each and then make a determination what makes the most sense for your budget protection now we have a a bunch of items here i suggest that you download the slides and you can actually review these at your own pace because trying to government is going to take a lot of time but before we leave this let's just say that most fuses are current limiting but there is a concept called threshold current ratio basically if the fault current is equal or greater than the threshold current diffuses current limiting and this ratio can be anywhere from 30 to 65 times rated and positive fuse so this is great when you have a high level of available fall current but for low magnitudes of falcon like an arc fault event they may not be perfectly effective at limiting that fault current so we also have pros and cons for circuit breakers again we're not going to read through all of these but you can see that the one of the primary advantages that we have is we can have solid state trip units that we can perform additional functions at the fuse can we can shape the shape of our time current crossover reacts differently all right um let's hand it back now to jeff and hopefully can make up a little bit time sorry jeff thanks john i appreciate it so you heard john mention codes and you heard john mention standards so let's talk about the differences codes typically are enforced by government agencies and govern the installation of systems to ensure safety everything you heard john talk about with the nec it talked about safe operation protection of this protection of that that's what codes are for standards are typically driven by industry and govern how components and assemblies perform you heard him talk about ul 489 you heard him talk about other standards that govern how the breakers operate and if a breaker is going to operate in a particular way it must do this and do that to meet the standard those are two very different things but they both play a part in our design work some of the codes that we play with all the time are pretty much all under the umbrella of the national fire protection association national electric code just happens to be chapter 70 of the nefpa then we've got 70e for electrical safety i mentioned 99 for healthcare facilities code anybody who does electrical work in healthcare facilities will be very familiar with chapter 6 of 99 there's also nfpa 54 the fuel gas code anybody want to run a generator we're going to want to know about fuel gas and then the one outlier that we will typically deal with if we're doing buildings is the international energy conservation code interestingly enough it's a code when it's really a collection of standards that talk about how a building should operate in terms of conserving energy but these are all highlighted here and hyperlink that you can click on and read at your leisure standards organizations also come to come into play and some of these you should be familiar with underwriters laboratories we talked about they're kind of the one gray area where they sort of venture into the safety realm more than just the operational realm a lot of components must be ul listed in order to be approved in installations then there's nema which we're all familiar with canadian standards and c and astm again click on the hyperlinks get familiar with all these codes as you need to john mentioned ul489 for breakers there are also some key standards for switchgear 1558 governs metal enclosed low voltage power circuit breakers and 891 talks about standards for switchboards and these will all be taken into consideration by the design professionals as they're designing the installation all of the codes and standards help with reliability and let's touch on on reliability and the bigger picture resiliency and redundancy everything we do in electrical systems we want them to be reliable and nowadays we want them to be resilient and in some cases we'll do that with redundancy generally our utilities are pretty reliable okay but as we know there are always mitigating circumstances all right storms floods freezing events for those of us down south just really make play havoc with utility systems if you read all the tariffs from your utility companies which i'm not going to read for you every one of these things basically says it's the customer's responsibility for reliability if you want your equipment to run 100 of the time that's on you not them so what you have to figure out is how critical is your function are you a hospital or your commercial office are you something in between only you can determine how critical you need you are some reliability data from utilities that will help you in your decision making you know a utility typically says we go down three hours per year we have 23 voltage sags below 70 percent 70 is where typically equipment will drop offline can you tolerate those in your installation how much insurance do you need and i use the word insurance because basically that's what this is we are ensuring that our facility will remain up and running during a utility outage or event a couple of strategies we'll touch on briefly the two extremes i call this the hardening of the facility the robust strategy this is if you have an infinite budget we make the facility flood proof we make it storm proof we've got multiple backups and backups of backups we've stockpiled fuel and supplies and we've got shelter-in-place accommodations for all of our staff option one very very expensive but in some cases maybe you have to do it if you're a critical healthcare facility level five trauma center you may have to go to these extremes on the other end what if we just abandoned the facility and ran away until the event was over and then came back it's a perfectly valid strategy those of us in houston during the february snowmageddon event that's what a lot of us did we shut off the water to our houses and we drained the pipes and we left and then when the weather warmed back up we came back quick restart is key to that and our electrical systems can be designed designed to support that as well we've got some strategies as we look at our electrical systems design multiple utility feeds generators redundant switch gear all uninterruptable power supplies if you're running a data center much equipment these days comes with dual supplies and then you can even use alternative energy sources solar wind fuel cells cogeneration other form of backup generators all of these can be factored into a resilient and robust facility so let's talk about the components of a distribution system that'll help us create these facilities to operate the way we want them to so in this slide you can see this is kind of a high level tree of where we where we do our electrical distribution system so we start with service entrance switch gear something called the point of common coupling or the pcc this is where we connect to the utility so everything to the left which is not shown in this slide would be the responsibility of the utility everything to the right is ours so this shows sort of a medium to large 480 volt primary service installation so we come in from our switch gear there's some sort of metering because the utility is not going to do it for free we've got a main switchboard which would then break off into a variety of distribution boards perhaps we've got a high voltage distribution board at the top there that feeds motors and large demand loads maybe we have large electric heat systems as well as pumps and fans and so on and so forth in in the old days actually in the not too recent old days we would always have a high voltage lighting board because most of our lighting circuits were 277 volts and which would then be its own separate panel and and be controlled accordingly then we would run into a high voltage to low voltage transformer and this would knock us down and get us into the convenience outlet realm the distribution board would fed from that transformer and run all of our 120 volt standard receptacle loads all right this is pretty typical for a larger installation about smaller installations suppose we're doing uh like a bank or a convenience store we don't need 480 volt service we don't have huge motors or huge demand so again we'd have our service entrance rated switchboard and if we had air conditioners maybe they're 208 volt three phase we can connect those directly we could have a lighting board nowadays with led lighting we can run 120 volt lighting circuits if we're not going very far or we can run 208 volt lighting circuit and then since our main service is 208 volt 3 phase we can have a distribution board and break that out and get 120 volts lined to neutral with no transformer so this is a simpler installation but again a much smaller installation and then we have emergency power the emergency power then this is conventionally based on a generator either natural gas or diesel we'd have some transfer switches transfer switches would then take over and feed various distribution boards or lighting boards depending on our installation this is a gross oversimplification of an emergency power system depending on your facility this thing can be this simple or extremely complex the especially in health care into nfpa 99 chapter 6 talks about how this has to play and how it has to be broken up so again if you're in healthcare space by all means get familiar with 99 national electric code also talks about components of an electrical emergency system as well so let's go a little deeper dive on some of our components we talked about switchboards and within our industry there are a lot of terms that get used in a variety of things their switchboards switch gear panel boards load centers so on and so forth switchboards and switch gear sometimes are used uh interchangeably switchboards are the large items this is where the service entrance comes in or main distribution occurs all right they're typically large physically large you know three feet wide four feet deep seven feet tall for the biggies and then they start when you start lining them up as you get larger and larger typically there are not a lot of connections in each switchboard because these are large connections large current demands current capacities so we need a lot of physical space typical sizes you know switchboard you start around 400 amps and go all the way up to 4 000 amps all right a 4000 m switchboard is not going to be a single 3 foot unit it's going to be several units bolted together and connected with a bus typically the switchboards are going to feed distribution or panel boards okay these are typically driven by geography and we're going to talk a little bit about where these things get located most often these are found in electrical rooms and these are going to be a little bit smaller and they'll have more connections depending on on what they're doing and the reason we want to we want to locate these by geography is as we we know voltage drop is a consideration and the higher the voltage the smaller the conductor we can get for the same distance so we want to be very judicious as we place our panel boards so we can maintain our our costs okay which is why we have transformers all right transformers change the voltage to what we need it's cheaper to run higher voltages longer distance and the nec has guidelines for acceptable voltage drop and this is basically just due to the i squared r losses in conductors so if we get the voltage up higher the current stays lower and our conductors become less of an issue the thing to remember is whether we're at 480 or 208 or 120 all of our conductors are rated the same they're all 600 volt conductors so we don't save any money by going to the lower voltage we actually save money running at the higher voltage because the conductors are smaller a couple other comments here that that we talked about already 483 phase is 480 volts line to line 277 line to neutral and the older lighting systems used to use 277. newer lighting systems use multi-voltage drivers that says you could go as low as 120 volts for your lighting circuits whether that makes sense or not would depend on the size and the distance it's also nice to know that if you've got an existing 277 volt lighting system you can retrofit it with new led lights and not change any of the wires and then 480 volt we transform that typically to 208 three phase which gives us our 120 volt convenience voltages back to you john thanks jeff um i'm going to say this really slow because it's a really important point the safest way to work on any piece of electrical equipment is to have it fully de-energized and locked out you can't electrocute people and burn down buildings if it's turned off unfortunately it isn't always possible the energized electrical equipment that's being worked on operate and interacted with so the question is if we can't turn it off how do we quantify and mitigate that risk when we can't de-energize the equipment we constantly talk about reliability and uptime to make sure that we have more to enough capacity to serve current and future loads but in the same breath if something bad happens we have to have certain design and operation principles and practices this is where osha and nfpa 70e come in although the nec is not a design manual it does contain prescriptive practices regarding how distribution systems are designed and installed you know things like you know service clearances that jeff will talk about later and some other constraints however the nac is not intended to tell you how to operate that equipment in a safe manner after it is installed so why is that concern well if you take a look at the little factoids on here you can see that in the early 1970s up to 14 000 workers were being killed on the job each year so in 1970 the op the occupational safety and health act passed this act is often referred to as a safety bill of rights and led directly to the formation of osha the goal of osha is to ensure safety safety and healthy working conditions for work for anybody to ensure good work by setting standards and enforcing standards so the act says that you need to provide a workplace as free from known and recognized hazards but how do you do that the part of the federal regulations associated with the occupational safety and health standards for electrical installations if you feel like looking up is in this outline on this particular page aside from having a whole bunch of blank sections when you go through it that are reserved for future use you'll see that a lot of the safety design standards strangely mirror that that are within the ndc you also see that the sections related to operation and maintenance of the electrical equipment is oddly vague in detailing exactly what safe work practices and this is where nfpa 70e comes in osha considers 70e as the primary consensus based standard that addresses electrical hazards in the workplace and goes into significantly more detail than part 1910 so while osha does not specifically enforce 70e it's often used as the fine print to support osha's own standards it's expected that you know those blank sections that we're talking about will eventually be rewritten uh to reflect the requirements of 70e just like some of the parts already reflect the nec in the earlier portion of 1910. okay so we established that there's a distinction between the nec and 70e the nec is primarily design and installation and 70e is primarily operation and maintenance but on the operation and maintenance side when we think about safe work practices the best way to ensure safety when maintaining electrical equipment is de-energize and lock it out however there are multiple situations where turning that off is not desirable or feasible data centers hospitals what have you so if an electrician needs to work on that piece of equipment while it's still energized how do you mitigate the hazards associated with that and more importantly how many hazards do you have typically the first thing that comes to mind when you discuss hazards is arc flash the question is what can you incorporate it into your design to reduce that hazard the nec started to address arc energy reduction starting with the 2011 version the original requirement was just limited circuit breakers in 240.87 however this is accomplished for uh however the requirement for fuse switches that you see here 240 67 wasn't added until the 2017 version and recently just took full effect uh um how we accomplish this arc energy reduction for fuses and circuit breakers for fuses and circuit breakers is slightly different and we'll talk about this in the next few slides so the energy released by an arc flash is characterized by the equation i squared t with the variables being current and time so based on that equation limiting the available current can have a significant impact on the amount of energy released however for many installations you can't adequately serve your load unless you have that high capacity electrical distribution equipment so you're stuck if you can't limit your fault current because you have really big equipment you have to address the other component of i square t basically the time component you have to clear the fault as quickly as possible if you remember in those previous slides for the time current curves both breakers and fuses react quickly to bolted faults in the instantaneous region remember that dog leg curve and that dark leg and the half to one cycle range of the molecule circuit breaker however the magnitude of current associated with arc flash faults are typically only a third to half of the magnitude of a full-on bolted fault this puts us in a different place on the time current curve so the code requires that we provide some type of arc energy reduction and refuses that's for 1200 amps and larger same circuit breakers if that fuse can clear an arc fault in point zero seconds or less you don't have to do anything else but that's dramatically harder than it sounds again the minimum and maximum melt times for fuse aren't adjustable like a breaker of a solid state trip unit in most cases you're stuck providing some type of supplemental tripping device uh the code gives you you know five options here to accomplish this but unfortunately implementing most of these five methods you're basically duplicating functionality that is much easier to accomplish with circuit breakers we'll see in the next slide that most of these improvements methods are duplicated for circuit breakers so with the exception of zone selective interlocking and instantaneous strip settings you can see that the methods clearly mirrors that perfuses um i can spend a whole bunch of time on this slide so we'll probably answer a couple of these a couple of questions about these later on in the q a section all righty um oh yeah going back to the previous slide for one quick second there is one uh typo in this slide there is one additional method which is having an adjustable trips uh uh an instantaneous strip set i think that needs to requirement all right um this is a big backwards we probably should have talked about exactly what an arc flash is before diving into the code requirements so let's make this quick let's focus on the last two bullet points in this slide arc flashes usually don't happen spontaneously when no one is around normally they are the direct result of someone interacting with the equipment that person is typically doing something that initiates the event it might be racking out a breaker it could be dropping a tool whatever uh we're running on shorter time so let's make this quick again the arcing current will be significantly less than the bulk to fall current somewhere around a third to half of the uh of the bolt of all current you're conducting air that current through an ionized plasma bridging an air gap between energized conductors and a grounded component when it happens in an enclosure like a panel or switchboard the enclosure serves to magnify and direct to release energy which makes it more dangerous for an electrician working in front of the piece of equipment okay jeff let's bring this into the home stretch all right thanks john um let me see where we're gonna go all right so basically arc flashes are dangerous wherever there is when you want to be somewhere else so in terms of space requirements the code is very prescriptive but basically bigger is better and and location is key from our perspective but it makes the architects hate us okay but we want electrical rooms to make sure that they're big enough they're safe they're convenient for our maintenance folks and they're located in places that it makes sense for our electrical system so we're not running huge conductors all over the building back and forth okay maintenance likes them near the equipment architects hate to give us the space for them but that's just what you know we have to deal with in our world nec dictates how many things are allowed on a circuit nec dictates wire size based on load all of those things are going to come into play when we design our electrical system and start to lay out our rooms any nfpa 70 rules like we talked about it's all about safety article 110 you can read the code gives you all the details about about space requirements i'm going to fly through these basically three and a half feet is your friend i know three feet is the minimum but go with three and a half and then you're always safe unless you're going to deal with medium voltage one thing to be careful of here is an nec characterizes a brick block or tile wall as a grounded surface so that kicks into the three and a half feet space okay keep that in mind egress is also governed by nec personnel doors are required at least one maybe two depending on the opacity of your switch gear you can play games with doubling the working clearance greater than 800 amps you got to have panic hardware and the door has to swing out so we can get out various other rules here you gotta to be aware of and also the last one here know who your authority having jurisdiction is i can't tell you the number of times we get into code discussions with the ah about how different things are interpreted so know your ah know what they like know what they don't like and and your life will be much easier okay if you go over a thousand volts the rules change basically the clearances just go up okay future proofing this is very important as a design professional when you're creating spaces and you're creating systems to get with your clients and have help them understand are you ever gonna grow this facility is this phase one of a multi-phase installation it's much easier to leave space in the original design than to try and come back later and shoehorn something in we had a little video there but we're not going to show it i don't know if it'll be available maybe they can we can make it available to you after the fact but it shows uh how we tried to shoehorn some equipment into an existing electrical room and it was quite an adventure we were able to do so but it did work so real quickly let's talk about median voltage you know we talked about i squared our losses in conductors and one way to get those down is to get the voltage even higher so medium voltage what is it and why would i want to use it so here we've got an ansi standard okay ansi standard defines median voltage as 2400 to 69 000 volts another definition specifies median voltage is 1000 to 35 000 volts so the answer to the question what's medium voltage is it depends on who you ask but for all intents and purposes i think anything over a thousand volts is you're in the median voltage range 69 000 is kind of high 35 is probably a better number it just depends on what you're doing when you're getting into that class of voltages 35 and up you're actually starting to get into electrical distribution as opposed to facility type work and then industry breaks it down by classes of the end use equipment 4160 volt motors are very common and that's what's considered 5kv stuff 1247 is a common underground distribution for medium to large installations cargo terminals for example that have great distances to cover and large loads that's in the 15 kv class you'll also find 13 000 volt distribution i actually ran across the distribution voltage the other day when i was out for a walk that i had never seen before it was 19 000 volts so there's there's a variety of things out there so why do you want to use it it's common we talked about rural overhead distribution it's an equipment requirement is what drives it it's driven by what are we doing you know a 3000 horsepower motor uh and where would you have one of those a water treatment plant a wastewater plant you know something that's moving large amounts of something in this case water you know it's 2700 amps at 480 volts i can't even imagine how you would run conductors to that thing if you could even find one but at 4160 it's 300 amps piece of cake you can get 15 kv or 5 kv cables that do that all day long the higher voltage means the conductors are smaller the insulation is better and different obviously because the voltage is is higher the switch gear gets larger usually deeper and a lot of that has to do with the arc arc capability of the higher voltages the switchgear of course is more expensive there's a whole line of arc attenuating switch gear when you get into the medium voltage class and it's a different maintenance model if you're an existing facility that's got folks that can maintain 480 volt equipment if you throw 4160 into the mix it's very different for them so you got to keep that in mind so basically use it where it makes sense and the roi and the geography support it and with that i will give it back to our lead presenter amara all right awesome well thank you jeff and thank you john that is a ton of information we're going to take some questions now so please type your question into the ask a question box and we'll get to as many questions as time allows questions that we do not get to will be posted at www.csemag.com with the archived version of this webcast to download the presentation slides please use the event resources on the left side of your screen don't forget you can earn continuing education for this so you will have to take an exam at the end but you'll get one hour of continuing education all right jeff and john we are going to start with the questions john this first question is for you can you please explain arc flash reduction switches hey john i'm going to jump in here if you could please unmute yourself and explain arc flash reduction switches thank you thank you so you can see in this picture here this is a maintenance switch basically this switch is interlocked with the electronic trip unit for a circuit breaker basically when you enable this switch to turn the maintenance mode on you are forcing that switch to defeat any type of time delays that it has in the instantaneous region again with the i squared t equation we're addressing the t component we're making this breaker operate as quickly as possible to reduce that overall magnitude of current the downside is that switch is a manual function you turn it on and off so you lose all your protection or reduce your protection when you're in normal operating mode and that maintenance mode is turned off all right awesome thank you john now jeff the next question's for you and you touched on this a little bit but if you could give us some details what's the difference between high voltage and medium voltage could you give us those ranges please sure so i'll even go so far let's talk about low voltage and low voltage is anything up to 600 volts so typically most of us are going to operate in the low voltage range with our 480 240 208 120. medium voltage depending on who you ask is either one thousand to thirty five thousand volts or twenty four hundred to sixty nine thousand volts and then high voltage is anything above that are typically we are going to operate at medium voltage we're gonna operate in the 4160 or the 5kv range or the 1247 13 000 which is the 15 kv range okay lots of numbers there got it john the next question's for you and i'm going to combine a couple questions so if you need me to repeat anything please let me know um so talk about circuit breakers and zone selective interlocking so the concern is controls communications bringing all these things together and selecting the right methods can you talk about that a little bit please sure so with zone selective interlocking you have multiple breakers in series each with an electronic trip unit and all interconnected through a communication bus so these breakers can communicate with each other and you can basically communicate where a fault is happening in in respect to any of those individual breakers and typically you want the breaker that's closest to default operate first so when the record as closest to default operates operates first it is inhibiting the the tripping of breakers that are upstream so you can limit that that interruption to your current to the smallest portion of your distribution however when you're inhibiting the the tripping of the upstream breakers where the most amount of fall current is that really doesn't do anything for you from an arc flash standpoint so you're going to use the benefit of being able to sense current at each one of those locations and flip it on its head and basically while in the traditional selective coordination of with so and select with its own selective interlocking instead of tripping at the breaker downstream you're tripping the breaker at the main to quick as quickly clear that fault as possible so basically the breaker at the main sees current calling in but the breaker downstream doesn't see the current going out so you know by by natural logical function that the fault is occurring at the main and then you have a hard fault condition that you should trip that breaker quickly okay great thank you we have a lot of questions here if you do have a question for one of the presenters please type your question into the ask a question box we'll try to get to as many as possible jeff for you this next question and i can rephrase or reread anything this kind of goes back to your sizing portion where you talked about sizing electrical rooms can you talk about initially sizing these electrical rooms at the beginning of the design when you don't know the load or the demand on that particular building uh sure um just draw a box around the whole building and say this is it no i'm in all seriousness yeah um you're going to have the loads aren't going to be known but you're going to have to make some assumptions you know five watts a square foot you know about how big the building is you know go from there but in all reality you know make it twice as big as you think you need to um because then you can always negotiate with the architect when they're screaming for more space and take more than just the code into consideration you know consider that the maintenance guys have to get in there if this is is high current switch gear they're going to have to roll breakers in on carts they're going to have to rack them out they're going to have to maneuver so be kind to the maintenance folks and they will they will appreciate it fantastic thank you and jeff this last question is for you we only have time for one more it looks like again this kind of goes back to the sizing and the design of electrical rooms can you talk about the panel layout and placement and then put that into perspective with voltage drop sure so obviously you know voltage drop is is clearly a function of the the current we're going to try and run down the wire and it it really becomes a cost discussion as much as anything else if if we're going to run a lot of current a long distance we're going to pay for a lot of copper we have a cost associated with that versus taking up another 100 or 200 square feet in a building and that's a negotiation that has to happen with the architect ideally our electrical room would be right smack in the center of the building so all of our runs would be as short as possible but we know that's not realistic so we try and and compromise you know if there's an elevator core maybe we can get near there and just go vertical in the building so it's it's really just a return on investment kind of discussion based on what the building is going to be used for and how much space the architect can give us got it all right well thank you that's some terrific information and a lot of information i'd like to wrap up by thanking these extraordinary subject matter experts john yoon and jeff thomas for sharing their extensive knowledge of electrical rooms and design i'd also like to extend a special thank you to our sponsors abb cyber sciences and starline a brand of legrand for supporting this education session before you go we need your feedback to improve future education sessions a short survey will pop up on your screen as soon as this webcast ends please take a few moments to complete it finally on behalf of consulting specifying engineer and cfe media and technology thank you for joining us we'll see you at the next education session thank you and goodbye"

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"VideoID": "2057",

"Title": "PD 02 03 01 Essentials Build Simple electrical system",

"URL": "https://www.youtube.com/watch?v=8wa05m-fPUM",

"Keyword": "Electrical system design",

"Transcript": "hi in this video I'm going to build basic electrical system which will be used to demonstrate the calculations and the report tabs starting from the Home tab let's create new project using our custom template plus press create now we're going to add Transformer as a supply switchboard and three-phase distribution board now I'm gonna add three-phase cable as a supply using my template I'm gonna add basic circuits and explain the best way of doing so we have a lighting circuit single core cables MCB type c breaker rated 10 amps and then we have some power circuits which you can copy and paste by the way this template the Excel spreadsheet is a distribution board chart which is able to perform basic load calculations you can download and use it for yourself it's free of charge as long as it's registered I'm gonna move this uh to my other screen so I can see better and start creating the circuits double click on the distribution board let's leave the display does 24 Ways increase the windows so we can see better and I'm gonna add First Circuit double click on the text spare and then double click on the cable text first what we want to do is to is go non-standard for the circuit ID include y include phase include connected from protection from our template type cmcb I remove the auto and select 10 amp let's say this will be a commercial site so the lighting circuits are typically protected by 10 amp Breakers cable ID when you calculate the system and create reports if you leave this as Cable ONE you will not be able to work out what the cable you're looking at so the best way for the circuit name is to use non-standard and then include the final circuit reference do not type anything in just leave it blank select the cable single core thermoplastic I will use the 90 degree so I search for Run 2 and then select single core lsf cable the rating of the cable the current carrying capacity is the same as the 70 degree cable method of installation it's conduit or trunking select trunking horizontal suspended the trunking is metal cable I never use Auto for my circuit but if you want you can but remember to fix the design the available minimum cable size is 2.5 I think I've got cable size limit the load is fixed equipment single phase and neutral if I change it to lighting and go back to my cable now the minimum is set to 1.5 so I can change it design length the lighting circuits are typically quite long let's do it as 55 meters the rest you can leave as it is grouping because the load is minimal LED lighting you may have 1.2 arms or less on the circuit and here the cable carrying capacity is 17 amps and if the circle is grouped with other lighting circuits the load is less than 30 percent of the cable capacity so you can ignore grouping CPC remove auto and select 1.5 let's go back to load for the name I will use the window here name because I've got inherit the name is automatically copied over here that is the correct way of naming this is not domestic circuit rcd is not required link to the first fitting let's say 12 meters design car end let's say 1.2 amps power factor for LED lighting is 0.97 diversity industry Benchmark for lighting is 0.7 SPD there is no SPD and I am not going to display results press OK I've got my lighting circuit let's say I've got a few of those lighting circuits so either right click and go copy and then select another Circuit by aiming for the text right click and paste or now I've got this in a memory I can just go select the circuit and then press Ctrl V which is paste I've got my three lighting circuits let's imagine this distribution board is split metering lighting and power board let's imagine the first four ways is lighting and power starts from 5l1 what I do now I select the text right click split way now 5l1 is selected I will press Ctrl V to paste lighting circuit double click on the text of the cable ID and based on my table I'm going to create small power access control circuit here I'll copy the name I will use single core cables in trunking so the cable type is correct I'm going to just change its size grouping this is power circuit run with other circuits in trunking let's say apply grouping of five that will derate my cable to 0.6 60 percent CPC I am changing it to 2.5 load the name of the load I have it copied so I just Ctrl V to paste uh it doesn't fit let's try and up here okay because this window does not allow me to enter long text I've changed my mind and I'm going to use the ID window instead now stop stop stop don't do this this is bad idea because if you're gonna leave the load name and use the ID field for the purpose you will not be able to use into its full capacity the data entry tool which allows you to make changes to multiple circuits at the same time let me give you an example okay because I haven't got the name in my circuit any circuits that's the load so you see I've got the ID of the load but I haven't got the name that's what's being displayed in here how can I find my sockets going to change cable it seems like the name would be useful okay well I've said I've decided to go with ID as a reference for the load because you can enter more text it's not ideal because you can't now search for the name of the load because of what I showed you do not use this ID field for name of the load the correct strategy is this look I just copy part of the text because it would not fit leave that blank so I have an ID referencing the circuit I'm not gonna type anything there what I'm gonna do instead keep inherit and enter the text in here so instead of small power I'm going to say pwr access control I don't need to say Supply because there's obvious Access Control Supply right so this is the correct naming and look when you press inherit the name will be automatically copied over that will allow you to use the full functionality of the data entry tool now this will be Access Control Supply so the type of the circuit is different most likely it will end up with a Spur fuse connection unit so I'm going to select fix equipment single phase and neutral lower the Mind circuit again from schedule my load is four amps and 0.9 power factor apply this to my circuit diversity if this is access control it will not be Diversified so it's on all the time press OK let's create another circuit 5l2 small power firearm repeater panel the cable type will be different FP 600s 2.5 mil 16 amp radial circuit load 3 amps 0.9 power factor by the way I've noticed that I forgot to change protection in 501 which need to be 16 amp MCB I specifically don't want the RCB on the circuit on the security circuit now that's correct I'm going to copy this circuit Ctrl C select another one press Ctrl V I'm going to adapt this to fit my new circuit that's the quickest way of working first of all the circuit reference are correct cable references correct cable type is not correct I'm going to search for 600 select fp600s that's the fire rated cable rated one hour and it will be on perforated horizontal train cable size 2.5 grouping six depending on your installation this is armored cable I'm going to go for single phase Supply I will select the CPC to be integral and I'm going to calculate the armoring as a earth path together with CPC so instead of armor all separate iGo Armor Plus separate integral and now the image below shows you that both Earth paths will be taken into account during calculations right so now we're gonna name it correctly we already have inherit selected I copy and paste main correct name file and repeater panel and that's already changed that's good thank you load power factor 0.9 diversity is one no SPD that's it protection that is also 69 okay now I'm going to create similar circuit Vesta is fire alarm Life Safety circuit it should be wired in fire rated cable copy the name copy the circuit double click change name and again let's change the name in this field here copy and paste name automatically inherit the correct name load forums power factor the same grouping the same cable type and method of installation the same okay we are going to create another 16 amp circuit but this time it will be lsf armored four millimeter Square 16 amp Commander socket for data rack based on my historical data typical load of the data rack is 6.5 amps this is based on the active equipment installed obviously it is Project Specific and it needs to be checked quickest way copy that circuit select this three-phase circuit and paste now we ended up with three circuits if you have repetitive circuits types that's quite quick way of working for now I'm going to delete them and then double click on L1 let's change its name first copy and paste data rack Commander socket there is no option of 16 amp and if I select 20 amp and protect the circuit with 16 amp breaker it will come up as an error to overcome that problem I will select fix equipment single phase and neutral design current 6.52 power factor 0.93 diversity typically this equipment diversity will be one no SPD but you may need SPD for such circuit this is Project Specific protection definitely not rcd okay let's create some general purpose sockets I'm going to create this radial and ring circuit and then I create another fun coil ring circuit depending on the length of the circuit the load may not be a problem but the air fault Loop impedance could be that's why sometimes we run ring circuits for fan coils first let's create typical radial socket circuit I'm going to copy existing and paste rename it first let's update the name general purpose sockets and I'm indicating that this is a radial circuit general purpose sockets this will be radial circuit 20 amp rcd is required it is not in dwelling it is commercial but there is no risk assessment I'm going to Art protection change protection to type crcbo 30 milliamp 20 amp cable change it back to single search for run select single core 90 degree run to 70 degree in trunking horizontal suspended metal cable will be four millimeter square CPC four millimeter square grouping typically between 5 and 9 depends on the project I select five load on Commercial sites it is calculated as 25 watts per square meter at Reba stage 3 and at detailed design stage usually load is calculated as per number of points since this is General socket outlet and the connected load is unknown based on my schedule I will have load of 3.9 amps power factor 0.9 and my diversity will be 0.2 no SPD protection is done okay I'm going to create ring circuit copy that paste double click change protection to 30 to 1. cable installation method is the same but I'm going to change size to 2.5 millimeter square grouping I'm going to leave it as this CPC I change it to 2.5 I don't want this in order when the cable is too small I will get warning rather than thinking everything is all right not knowing or having control of the cable size okay this is a ring circuit let's change the name ring that will be automatically updated you can't see but it's updated ring circuit design current 9.2 amps power factor should be the same diversity 0.2 no SPD okay happy days now I'm going to create ring circuit for my fun coil units split way copy the circuit OK double-click go to protection I'm going to change from rcbo to MCB it needs to be 30 to 1 if you want to ring otherwise the software will complain there will be an error message because bs7671 have an example of a ring circuit and the ring circuit is protected by a footer to unprotected device so that's what I'm going to do but I don't want the RCB on fan coils let's change the protection first type of the circuit is the same just changing length to say 87 meters this is the whole length of the cable not just one leg of the Ring leave a grouping at 5 CPC 2.5 let's rename this it's not General socket it's fun coil it's a ring so I'm going to indicate that not a standard circuit but sometimes because of very long distances you may choose to use a ring circuits or fun coils type of the load if you want this software to calculate this circuit as a ring you have to leave this as ring and then rcd will be required in this case the only option to calculation without error is to select not indwelling undocumented risk assessment the other option is to run your fan coils as a radial circuit if you have the new version of the software this panel has slightly changed to align with new vs7671 so instead of not using dwelling you have used by instructor or skilled person or option to choose not in high risk residential buildings housing multiple occupation purpose-built student recommendation or cohomes that's the change depending which version you have okay let's finish this allowed will be 6.96 amps power factor 0.86 no SPD Happy Days so I created few typical circuits which I can copy and paste I can now copy this distribution board select it together with a cable press Ctrl C and Ctrl V you can see the numbers are automatically copied and changed go into distribution go into circuits double click you see my circuits inherited the name of the distribution board and they have correct naming this is the quickest way of working press ok now you are ready to calculate detail calculation will be covered in separate video what's important here is that before you proceed and Carry On Building your electrical system and perhaps copying and pasting existing DBS and the nested circuit you possibly would copy and paste the errors so what you want to do first is you want to calculate the circuits as they are seed arrows deal with them if there is no errors happy days if you have arrows fixed arrows before you copy and paste it elsewhere so you need to calculate first go to calculation Tab and calculate only if you have no errors copy and paste the circle to all distribution board here I have an arrow with the submain cable and the two final circuits so you see if I copy it and pasted the distribution board with these arrows I would then carry on the arrows across and create more work for myself so before you proceed and copy and paste to build the system you may have distribution board here another one here before you do that and create yourself a lot of work and the needs to deal with more errors you want to fix the problems before you proceed okay so please remember good practice is to fix the problems before building the electrical system further you can copy distribution boards with the circuits or you can copy individual circuits across distribution boards that's why it is important to have a typical circuits create at first because you can quickly copy them across shuffle them put them into correct ways and that's the quickest way of working okay so the calculations will be covered in separate video this was just introduction on how to create the system thank you very much for watching"

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{

"VideoID": "2062",

"Title": "Online Battery Energy Storage System Design Training from Advance Electrical Design and Engineering",

"URL": "https://www.youtube.com/watch?v=4-b9WyGMrM4",

"Keyword": "Electrical system design",

"Transcript": "detailed study about the load pattern okay and what type of load to be served by battery energy systems okay okay now what is mean by load load is any kind of electrical equipment or or mechanical equipment which will run upon the electricity right right so in that there is a major three classifications one is resistive second capacity and third one is inductive load right yes and uh in practice normally AC is more populated than DC why AC is more populated than DC DC current or DC equipments If You observe uh let's say example of city right why we are not transferring the DC current from one point to another point y e c odas um so only one major important thing yes uh when you are transferring the sorry no no he has not joined okay okay so there is some noise from your end okay uh the main reason is if you are wanted to transfer from position one to position two or a to B the major call is your power your voice has okay right hello hello yes now it's fine okay so uh I'm saying about the why AC is more populated than the DC okay so there are two aspects very first one is your economy and second is efficiency okay so efficiency will populate uh with respect to the technological aspects like when you are transferring a load or a current from A to B right so there is a power loss between the cable and if you are using the DC power so there will be huge loss because you cannot push the voltage level as high as you required but in AC you can shoot it up to 11 KV 22 KV 33 KV right and once you voltage is Rise your ampere goes down and ampere goes down it will help you to reduce the loss so that will help you in in the form of efficiency enhancements write the transmission efficiencies and based on economy uh again the similar point when you are using the DC appliances there will be a huge cost if you look at the AC Appliance expression their magnets come into the picture to operate it right yes yes so if you look at overview only one reason you can understand its economy and efficiency because of that we use AC More rather than the DC right yes and whenever you required a DC Appliance to be powered with your AC Supply you either the device is inbuilt having a converter system or you need to put a converter or inverter uh I would say which will be converting your AC power to DC power as per the application yes now the point is when we have more populated part of AC so there is uh performance of the power or let's say the purity of the power come into the picture so what the factor which is showing the Purity which is power factor okay right as high as the power factor best quality of the power is there so now what is the power factor definition in theoretical you could say the formula that it's a true power upon apparent power or it's a kilowatt upon KVA right okay so but what is it actually so it's actually the cosine of the angle between voltage and current what is the power power is a v i cos Phi correct if you look at the single phase so what is the power factor it's an angle it's in a difference or angle between your current and voltage so it's a cross angle basically that's why cosine of the angle between voltage and current this Theta this Phi okay okay in AC circuit a current and voltage are in a phase within a phase there is a current and voltage right the flowing in the standard form yes that's why we can able to estimate this five and in DC it is a direct so there is a no Phi between your voltage and current it's a straight line correct so that's why DC Supply doesn't have a power factor okay right if you look at this I think you were aware about this this is a power uh Factor triangle right yes there are also a similar triangle which is power triangle I'll show it to you so this is a power triangle at the bottom this is your real power this is the reactive power and this is the upper and power right the government will going to bill you according to this actual usage what you did at your appliances is the real power or true power with this and this is the resistance and then uh losses within the system so Theta is as less the cost value will again towards Unity or Theta will be as uh Max the reactive power will be more is it right yes nine so once your class 5 figure is towards one or Unity right then your power is very much pure or there is a very less loss within the power yes yes right so if you look at these three triangles so this is the power factor triangle this is power triangle and this is about to impedance triangle so power factor it's a COS Phi you can estimate right if you look at the figure P which is power triangle uh this value because as we have this is apparent power v i so the amplitude or yeah amplitude for this is It's a v i cos Phi right so Azure cos Phi equal to hypotenuse a bound yeah adjacent upon hypotenuse adjacent upon hypotenuse right cos Theta equal so adjacent upon hypotenuse so hypotenuse into your cos y uh definitely these figures come out so right and if you look at the impedance triangle your impedance is nothing but the average out of your or root mean square of your resistance reactance correct and these three are based on the load types because resistance is for resistive load right capacitance for uh capacity load and inductance for inductive load right and impedance is all together root mean square of all together yes so your power factor is very essential when you are treating towards your or having a judgment for the power Purity okay and because of the various load types the power factor varies with respect to the load types okay now if you look at the observations for lagging power factor what it affects for leading power factor and for the unity power factor how the picture representation and what is the exact graph it shows so very first lagging power factor when you are looking at the lagging power factor what it means actually when it's a lagging power factor current lag and voltage okay that is a leading power mostly capacity okay okay if when there is a inductive circuit definitely there is a lagging power factor it means voltage is going to leave right okay I'll give the example like a fan ceiling fans that is a If You observe that there is a Motors right inside of ceiling fan so motor is having inductions right so that is a truly inductive load to manage the power factor we are putting a white cylinder there that is a capacitor right yes so why we are choosing that to maintain the power factor for particular device okay correct so that is an inductive load basically but and because of inductee load it's a lagging power factor and to maintain the power factor what we are doing additionally we are trying to put a capacitance or capacitor right yes and in the leading power factor you have uh let's say it's a capacitive circuit itself right synchronous condensers you can use uh wherever there is a bank of your capacitors then you can smoothly work upon okay all right and when you are looking at the unity power factor if you look at the pictures so unit is this point your current is also starting and from this point your voltage is also starting and these two are merging on a same line okay though angle between current and voltage is again zero here and this scenario in the AC is very ideal a very rare chance will it happens yes okay very rare chance and uh make sure have a note of it power factor never more than Unity okay practically it should be close to Unity but not more than one it's always 0.99 something okay as for the industry discounts the distribution companies are saying that you should maintain your power factor more than 0.95 okay okay they are asking to maintain the same and whenever you are going for the new connection they are taking your single line diagrams to observe that and with respect to their instruction you need to manipulate and the design and you need to set up the design as per their rules and what strategy they've made for yes correct yes so that's why whenever we are putting a new power plant in the field uh we are taking the statutory approvals from the risk forms right yes yes in the discount what we are doing we are sharing our slts with them so they will verify at their end and if that works with respect to their Clauses they will approve if it doesn't they will ask to redesign it or having some uh additional part of the system right yes so that is there right power factor mainly right mostly they are focusing on the power factor and then earthing part okay they don't want to hamper their system because of your power plant yes yes right because they are serving to the uh everyone I would say because of one entity they don't want to suffer everybody so on the on the their point of view they are looking for your safety of the plant you don't hamper their system because of your power plant right and second part if you are using their power what would be the power factor for them yes so these are the very two core important part they are looking at if you if your system is fulfilled their requirement definitely they will allow you to put the plan okay okay yes no so these are the basically based upon inductive capacitive and uh resistive circuits and uh if I look at the open eye or naked eye observations you cannot observe uh what is the resistor load what is the inductive load what is the capacitor load if you do not have any instrument on the field right but in uh other way if you can observe its continuous load or intermittent load that you can do with the Naked Eyes yeah right like a fan is continuously running let's say for 24 hours that is case one right you can observe with naked eyes or open eyes right the and second scenario the fan is working for one hour and uh called for two hours and again start for one hour hmm and within the 24 hour cycle right so in these two scenarios very first example is for continuous load second scenario is intermittent law with a cyclic pattern and if you look at their behavior when they are going to operate see uh I'm giving the example of fan you can treat any any load electrical load okay how it works now what is the effect of it energy when electrical energy is used to let's say any electrical appliances it has a two things very first it serves the purpose and it will lose some amount of energy in the terms of heat yes right I think it's a Faraday's law or thermodynamic law when energy cannot be created nor destroyed they did not destroy this right only one form of energy is converted into another form so it's a conversion of forms but conversion is never happens 100 percent it will lose it will have a two to three uh different type of conversion like heat loss is there and the your purpose is also there right whatever it is rotating the machines or hitting something right or let's say uh what what else uh powering to AC any anything but having a connection to any equipment there is a two thing one is what the purpose for the device is made for and second is heat loss and because of the heat loss the temperature will arise yes and once it is power to particular system temperature loss I mean heat loss is there but the device is also having their own efficiencies correct and because of that you are losing your electrical power again okay now if you can observe these two diagram what what they reflect I will explain then you can observe let's say this is the graph for load and time okay this is again the same x axis is showing your time and y-axis is upon load so I started with this point from this right this is my load let's say this point and I started my fan at an instant what it happens if you look at the load load for the fan means let's say 500 watt of fan size right so my fan is just reaching to threshold and it will start continuous load correct yes if I click on this so it will let's say uh triggering point is this so if I just on the button my now you can see this so from this point if I just click the button it will shoot whatever the power required the peak power right for the fan to operate it it will shoot to from this point to this point and post that it's a continuous like for a day it's a 24 hour right and once I offer the button it will immediately go down correct so this is for your continuous shoot up then your continuous process and then immediate shoot down right but if you look at the loss behind it as your power is consumed by your device so again the shooting of the losses will remain same it follow the behavior of your load the loss will be continuous loss will be continuous and again if you look at these things your load is more amplitude and your loss is lesser amplitude right because of the efficiency Parts come into the picture that's why we are saying the devices are best efficient devices are more better than lower efficient devices right yes and if you look at the third parameter how the temperature arise right from this point my load is suited to the peak point but whether my temperature is suited to the peak no it's just initiated and it's curvature path to follow it at this point because here is my Peak load at the last moment my temperature is also again last moment for this and if you wanted to observe from this point onwards it will again go down slightly this way the curvature will remain similar kind of things will happen going to here like this yes right now comparatively if you look at the intermittent load uh cycle what it happens load is again shooting 0 to 1 constant load for some duration then zero right yes again this is the hard for let's say two hours and then it will start arising it will constant and it will shoot down for electrical losses similar Whenever there is a continuous duty it will continuous with the loss as well yes but if you look at the temperature part it will initiate with the curvature with the slope right it will not instant uh raising the temperature it will increase uh gradually right with having a some slope and if you look at the no load conditions here there is a no load condition right so but uh this from this point onwards your temperature is again going down but this is this is not a image yet again I cannot go this temperature is having their own rate to cool it right so because of that it took some time basically it's a kind of like in a Layman a fan will work for three hours then it will get heat up and it will take approximately 15 to 20 minutes to cool down okay correct correct that is what and why why I am explaining because of the energy is going to lose because of your heat yes and it is not usable energy for you the purpose is fan needs to rotate and give us the cool layer or air right or create the turbulence in the air yes yes right but the that was the purpose but this temperature loss are serving our purpose no it's diverting the purpose second part this losses will they serve our purpose no they are again diverting the purpose and because of these two these are the impacting on our losses okay to the energy right let's say if it is a billing point of view you are built for all three yes correct the loss will be built to you not built by the uh built to energy producer it will be built to use a consumer right yeah understood this part yes yes okay so there will be a a fruitful example where you can understand uh how the greed connections or grid load and off-grid load we can correlate okay yes so there will uh from my perspective a load cannot be off grid or wrong Grid it's a physical connections the powering connection the powering Source right whether it is connected to grid means the this forms right then uh the load is called a grid type load and when it is connected to your batteries or bad battery energy storage systems part then it is called off grade load yes if you look at the definitions as well uh on grid system is one in which the power system is connected to the utilities power grid and the load which is connected or charged or powered whatever you say with the grid Supply of electricity called as on grade load right and if you look at the off grid of grid system is one and which the power system whatever power system means your load type whatever your power right is connected to your battery storage system and the load which is connected or charged or powered with the battery energy storage supply of electricity called as a off-grid load yes here you can look at the pictorial Point as the block block revoked Chris Paul uh supplied by grid then it is on grid it is supplied by batteries then it is But ultimately it's an electrical load it's the same for both the systems it's our predefined uh terminology to evaluate a better fashion for that right now there is an example which will be correlating these things and this will help you out to understand more clearly okay the problem statement Municipal Hospital operates uh do you have calci with you not right now okay so uh whenever we are having the session please keep all three things with you notebook I am noting down every topic thank you next time okay no worries no right now you can manage it out I'll explain even a single computation as well okay but this will help you out to understand more clearly once you go with the your Hands-On calculation so it will help you to understand it as quick as possible okay so take an example of this a municipal Hospital operates 24 hour in a city okay let's say in gurgaon itself hospital is having a two numbers of OPD and it required five kilowatt power supply constantly for each OPD also it operates three numbers of General words and consumes four kilowatt power each there are 20 numbers of doctors cabin powered with two kilowatt each cabin kindly find the total power and energy per day require ment of the hospital this is the one question second also find find out the energy required for a month if it operates 25 days per month right also find the battery capacity the third point also find the battery capacity to operate the hospital with a partial load and must have one day backup plan interesting it operates 25 days per month okay also find the battery capacity okay now what would be the first step first is two numbers of OPD that is a five kilowatt each total load is then we have 12 kilowatt four into three that is for your general word loaders cabin 20 into two 40 so total is 10 12 40 62. it's your load it's a power Demand right yes now what is the energy then energy is that what is the basic formula of energy power and energy what is the relation Twilight what is the formula for power and energy correct energy is equal to power into time yes time we have 25 no no if you look at this so this is the peak uh load for every moment you calculate correct so power is always instantaneous energy is your sum of particular duration okay Power may vary let's say 62 next moment it would be a 60. right next to next moment it will be 50. posted to it would be again 62. it's instantaneous but you calculate the energy for it let's say for a 15 minutes time duration it will be sum of all together okay with respect to time with respect to time right so here also uh we are doing the similar thing in a day very first sentence we marked Municipal Hospital operates 24 hour in a city yes so this calculation is for a single day right now you calculate for one day and then multiply with the 25 now that will work so energy required for OPD what is the power it's a 10 and for how many hours it will going to work 24 right yes here everything is calculated with respect to the peak power mostly the calculation will going to happen based on the rated power okay as this is the hospital scenario and uh the power what we considered here is absolutely or you can consider means it's under demand related demand from the hospital okay okay now so I would say it's a rather than having a saying the total power I would say rated power for the OPD right then it's a 10 into 24 to 40. yes yes so each day if I look at OPD will consumes 240 units yes correct yes so within 240 units how many OPD we are you using or powering two opds yes will consume 240 units each day now energy required for General Watts yes right now some of all together is a total energy required for the hospital right so 240 plus 288 Plus 960. is a 1488 kwh this is my this is for Hospital one day and yes this is my energy requirement for one day to run the hospital with this all facilities three numbers of General war two numbers of properties twenty numbers of Dr kabin which will be operating for 24 hours continuously yes so it's a continuous duty now right no that's it this is the answer for your first question what is the power and what is the energy required yes now the question number two if it operates uh also find the energy required for a month if it operates 25 days per month 10 into 25 now it's my 1488 yes right so it's a 37.200 kwh even I can write this in a megawatt hour as well 37.20 Mega Auto so for a month it requires 37 200 units of energy to operate the hospital right it's your second question's answer now third question also find the battery capacity to operate the hospital with the partial load and must have one day backup plan okay correct so now everyday energy requirement when it operates on full load what is the energy requirement 1488 for one day one 1488 right yes for one day when it operates on full load we we have already calculated that part right yes no it's of one for everything so daily energy requirement when it operates with the partial load what happened when it operates on the partial load because in the last question here they are mentioned partial load right and find the battery capacity to operate the hospital with the partial load and must have one day backup plan so if the parcel load means the half load so it means ultimately my consumption will go into half correct yes because uh either you do the half load or half time right it works so 1488 into 0.5 equal to 744 units now how to find out the battery capacity hence the battery capacity for one day great equal to should I say it's my energy requirement is equal to battery capacity 744 actually not because inner battery let's say it's your demand it's 744 is a Hospital's requirement to operate it right foreign [Music] but before that uh I would have two questions while charging and discharging is there any energy loss within the battery take an example of your mobile oh yes maybe yes maybe right not sure maybe there will be a loss uh I would say it's definitely there is a loss when you are charging the battery and uh discharging the battery why I'll explain you uh when you are converting your electrical energy into electrochemical energy battery is a combination of electrochemical things right it's chemistry having cathode anode separator and electrolyte right and it's a conversion of let's say one chemical form into another chemical form and when there is a phase transition it's a phase transition right and when there is a phase transition there is definitely heat up yes and this is the loss right yes correct and when again second point when you are using a YouTube and let's say uh any other thing or game when you are playing the game right why it's a discharging the energy with high rate yes yes right so charging and discharging is again a losing the energy so for that you need to take care the safety point of it right you need to incurt that loss okay correct yes second uh when you are using the mobile will you draw your energy from the battery up to zero or thus five percent the key up use can you repeat it when when you are using the battery or mobile okay until what percentage you are drawing out the power and post that you start the charging reward point I can not understanding your question so let's say you are operating your mobile right so how much you can use it till the percentage of battery at what percentage it would be up hundred percent zero percent um go to the charging point and just charge it right yes foreign out the battery let's say it's a cushion basically 20 10 right buffers you are maintaining that right you can never go below that so when you are using the uh when you are designing the higher specification of the battery let's say mobile package it's a Mah not in age also right it's MH is also very high because right now the mobiles come with the 6000 Mah as it is right initially it was only 3500 Mah but here in the electrical infra you are looking for kwh capacities of the battery it's a 10 to the power 6 times more capacity right so it's a huge comparative to the example of mobile so you never go for towards zero you will be hold somewhere let's say 20 or 30. so if you are using the battery of lead acid it's it has a requirement you cannot draw less uh below 30 percent of its capacity okay okay for leadership otherwise it hampers to the performance later on it hampers to the life of the battery if you draw the energy below 30 percent okay in the lead asset but in lithium ion you can draw out up to 20 percent or in some cases it would also work for 15 percent also one five okay okay it means you are having what is it hello yeah yeah go ahead why the efficiency of lithium ion is more than the leadership that is not a efficiency it's a chemical property of the material and that would say the specific energy okay right battery specific energy the terminology what we use in the industries battery specification specific energy of the battery okay okay so lithium ion is having higher specific energy comparative to your leadership that is their chemical properties basically that's why uh in automobile right now EV is boosting why yes lithium-ion is Boost why because of its uh the energy holding capacity or specific energy is more what is the specific energy definition for the specific energy is comparison with respect to the energy upon kilogram let's say one kg of lead acid and one kg of lithium ion who would store more energy or who would store more charge is lithium that's why lithium ion is used in the automobile because lightweight with the same energy capacity okay okay and for that you can say a safety Factor you are maintaining and here also I did the same thing 744 is your actual requirement is your load requirement right um multiplying with this factor is uh serving for your charging discharging factor and 1.3 is serving for your safety Factor the 30 questioning it is standard it's the design standard you can vary this with your own uh situations and the scenario of the designing part but mostly these two are uh very fair in the practice 1.2 1.3 okay now multiply this the figure will be 1160. I would say 1161 because the point called 6 4 is also there right if you wanted to look at the formula it's a required energy into charging discharging factor and your safety Factor okay so this is this is for your one day now they have also asked for one day backup into two so either you can multiply into two or I just sum up hmm either ways it works right basically for the 744 kilowatt partial load we need the battery capacity of 1161 correct to serve this load I need this much of my battery Bank [Music] percentage you do the calculation part 744 upon 1161 it's again 80 about 20 percent yes yes right yes how much it exactly 64 percent 64. ah 64 right why here two things are there your safety because 30 percent you are not drawing out anytime and 30 percent is your loss when charging and discharging that's why so so if You observe you are losing your energy how much you are losing 30 percent with respect to This 1.2 is a charging discharging that is your loss but ultimately with this this is stored in your battery itself but you are not using yes is there any thumb rule fixed for BSS capacity uh this is thumb rule you can trade this as a thumb rule but uh here this uh may be vary based on the application based on the battery chemistry but roughly you can use this roughly you can reuse this approximately 60 to 70 percent yes roughly you can use this okay right if you wanted to let's say storage of 100 units 100 units for required outcome right then you can put the battery pack of let's say a capacity of 130 or 140 kwh then you can easily draw the 100 units from that that would be the thumb root okay okay so maintaining your one day backup it is two three two two it's your battery capacity yes right understood this part yes yes how off-grid and on-grid load going to operate with this correct of course now moving towards next now we have one more Point analysis of existing demand and future demands of future requirements right what is that actually so existing demands is the demand at present actually right and connected to electrical Network as a load this is called the existing demand whichever is connected to the your electrical system foreign that is you called as an existing Demand right and the future demands which will be coming in your near future for uh in connection with your electrical load right yes yes that you that you called the future so to understand more visibly uh for this point we'll take the uh below example okay if you analyze the last example about the hospital right to the extension of the that example as well the total existing load is 62 kilowatt correct yes in the last example total load was 62 kilowatt and there might be there might be future upcoming loads requirements like increasing OPD sections or general Watts Etc this futuristic load quality your future Demand right the hospital Authority may ask for the electrical consultant that these are the my future demand would be right so with that perspective the electrical consultant should work upon the design and then they need to prepare the same 10 kilowatts for OPD then then so uh I just rolled out the example here so problem and what it comes considering the previous example if there will be expansions of the hospital services and load is added in near future as below two numbers of opds are on fine numbers of General awards are going to add We'll add this as same load as a previous five kilowatt and four kilohertz simultaneously what would be the best specification to run the hospital with two day battery backup okay consider partial load will be powered by battery energy storage system okay so we have previous power how much it is it's a 62. words it will rational about 2 into 5 plus 5 into 4 it goes to twenty ten plus twenty Thirty right yes now the total new power requirement is 92. 62 plus 30 right now we will estimate the energy part as well the energy required with the full load lastly we calculated it's 1488 full load right yes and additional energy required with the new load it's 30 kilowatt is new and 24 hour it's a 720 yes summing up these two total energy requirement would be 1488 plus 720 yes two zero eight kwh correct yes now that's it for 25 these things for one day right we were estimated these things for one days so for 25 days energy requirement it is again right um for a month it requires 55 200 units for energy to operate the hospital so every day energy requirement when it operates on full load is wait zero it two two zero at kwh so daily requirement when it operates with the partial load divided by two divided by 2 or multiplied by 0.5 yes so it's 1104 kwh right now hence the battery capacity for one day energy requirement would be it's 1104 into 1.2 into 1.3 it goes to 1722.24 so I would say 1723 kwh at correct and he asked for two days battery backup then into two yes so here then into two is only for the backup then you need to add one more because it's operating right two days is the backup and one is operating so it's a three days actually that's why I marked here he asked that what would be the base ESS capacity to run the hospital with for two days battery backup okay all right so two days is the backup plan yes yes so next two does it blackout so that's why it comes to two plus one one is operating two is the backup so 1723 into two plus one that is three so it comes to 5169 yes so this is what our battery capacity here the peak power is 92 with the partial load overall Peak power it would be for the battery the peak power is 46 because we are operating the partial load cell load correct but in general the peak power is 92. on the grid yes now if you look at this uh we are generally defining the batteries with respect to uh voltage and ampere hour correct age yes that how to estimate that part we'll see into the next topic and then uh with that detailing but in a uh very just initial point of view you can just do the calculation power equal to V into I right because it's a battery and it's a DC yes correct so V into I then power equal to 46 into thousand equal to I consider it's a 240 volt because uh I want to operate my existing AC outcomes right so that's right 240 into I so I is nothing but my full load current i f right so 46 in 2000 divided by 240 it comes to 191.667 . right hence the partial Peak power is 46 at 240 voltage and the peak current would be 191.667 okay these are my outcomes yes correct understood all right can I move to the next then"

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"VideoID": "2064",

"Title": "REVIT Electrical Power Lighting Wiring and Circuits - CADclips",

"URL": "https://www.youtube.com/watch?v=npcYonaaGZ4",

"Keyword": "Electrical system design",

"Transcript": "Is veediyo mein ham aapako apane emeepee prashikshan\nparichay shrrnkhala ke antim kuchh paathon mein vaayaring aur sarkit aur sistam brauzar\nke baare mein thoda sa dikhaenge, jisaka upayog ham revit 2014 mein kar rahe hain, isalie\nham bade neele aar par jaenge aur kahenge opan aur ham apanee namoona failon par jaenge,\nham us aaremee unnat namoona pariyojana ko phir se kholane ja rahe hain, jo phir se oke\nopan par pahunch jaegee aur ham isake bajaay ek prakaash yojana par jaenge aur ek baar\nphir main yahaan taiyaaree mein thodee saphaee karane vaala tha. isalie mainne socha ki main aapako yah bhee\ndikha sakata hoon ki main safaee kaise karata hoon, yah hamesha upayogee hota hai, main\naapaka sistam brauzar hoon, yahaan keebord par f9 hai, isalie aap keebord par apane f9\nke saath ise chaaloo aur band kar sakate hain aur main hoon agar main kar sakata hoon to\nbas ise thoda kam kar doonga, mujhe lagata hai ki yah utana hee chhota hai jitana ise\njaana hai isalie ham apane dijain laiting phlor plaan par ja rahe hain aur aaie laiting\nplaan ke star ko kholen taaki ham ise khol saken phlor plaan aur usake andar main jo\nkarana chaahata hoon vah yah pradarshit karane ke lie yahaan kee jagah ka upayog karana hai\nki ham kya karane ja rahe hain aur main kya karana chaahata hoon ab saaf karen aur yahaan\nek udaaharan hai main ek sarkit se chhutakaara paana chaahata hoon, theek hai, isalie yadi\nmain yahaan par hovar karata hoon to main vaastav mein netavark taib ko phir se chunane\nke lie andar ja sakata hoon aur taib kar sakata hoon aur phir poore sarkit par klik kar sakata\nhoon aur main kah sakata hoon ki sarkit sampaadit karen aur yadi main andar jaata hoon aur vaastav\nmein sarkit se hata deta hoon aur sab kuchh hata deta hoon, theek hai, yah sarkit ko hata\ndega, jise aap jaanate hain ki yah karane ke lie kaaphee jaldee hai, unhonne sab kuchh\nhata diya hai aur main kahata hoon ki khatm karo aur yah mujhe yahaan neeche ek chetaavanee\ndega aur paavar sistam sarkit kahega. 13 khaalee hai aur ise hata diya jaega, yah achchha hai,\nab klik karen, mere paas taar bache hain, theek hai isalie main jo karana chaahata hoon,\nvah yahaan taib par hovar karen aur phir yahaan chunen, mera filtar batan dabaen, sab kuchh\nle len, lekin taar band ho jaen, theek hai aur phir dileet ko hit karen aur ab adhikaansh\nbhaag ke lie mainne ise saaph kar diya hai yadi main is par hovar aur taib karata hoon\nto mujhe kisee bhee prakaar ka sarkit nahin milega, isalie us sthiti mein yah vaastav\nmein sarkit se chhutakaara paane ka ek tareeka hai dileet da dileet da sarkit se sabhee objekt\nedit sarkit mod mein hain aur phir baahar aate hain aur filtar karate hain aur vaayaring\nko edit karate hain, theek hai ise karane ka ek aur tareeka hai, main bas yahaan kuchh\npoorvavat kar doonga, kuchh poorvavat seedhe mere edit sarkit mod mein vaapas aa jaenge,\ntheek hai un sabhee ko le aao ek-ek karake vaapas jaana dilachasp hai ki agar main mandaraata\nhoon to yah mujhe charan dar charan peechhe jaane kee suvidha kaise deta hai yahaan par\naur taib aur taib phir se main apane sarkit par vaapas aa gaya hoon, isalie kisee bhee\nsamay main in logon ko chun sakata hoon aur yah mujhe bataega ki yah sarkit 13 par painal\nelapee 2 par hai, isalie yadi main yahaan apane sistam brauzar mein jaata hoon to theek\nhai aur main ilektrikal ke paas jaata hoon aur main paavar ke paas jaata hoon, vahaan\nbahut saare anaam sistam hain, lekin agar main neeche tak jaata hoon to theek hai, mujhe\napana traansaphaarmar vahaan mil gaya hai aur phir yahaan ke neeche, phir hamen apana\nsarkit brekar mil gaya hai aur phir yahaan ke andar main mujhe yah painal mila hai aur\nphir yahaan ke andar mujhe vishvaas hai ki yah vahaan kahaan hai, yah painal ke lie elapee\nhai aur vahaan mere sabhee sarkit hain, isalie vah sarkit 13 hai aur agar main kaaphee door\ntak dhyaan karoon to vahaan vyaktigat roshanee theek hai aur meree laiting hai niyantran\nsensar jo deevaaron par hain, ve prakaash svich nahin hain, ve keval prakaash ka sanket\ndete hain, unake laitar sensar jab koee kamare mein pravesh karata hai to roshanee chaaloo\nkar deta hai, isalie ye vyaktigat ghatak hain, theek hai isalie yadi main chaahata to main\nyahaan par rait klik kar sakata hoon aur kahen ki hataen aur yah ise hataane ja raha hai\naur aap dekhenge ki yah mere sistam brauzar se chala gaya hai, yahaan klik karen ab adhikaansh\nbhaag ke lie sarkit chale gae taib par yahaan klik karen mujhe abhee bhee taaron se chhutakaara\npaana hai, unhen hata den kyonki main chaahata hoon unhen rakhane ke lie aur phir dileet\ndabaen aur phir ham kar sakate hain ise saaph kar len theek hai to ise saaph kar diya gaya\nhai aur ham dekhenge ki sarkit 13 yahaan se chala gaya hai isalie unhen vaapas jodane\nke lie aapako bas yahaan vaapas jaana hoga jo ki mere niyantran ka upayog karake udaaharan\nke doosare aadhe hisse kee tarah hai batan, baakee sabhee cheejon kee tarah, aap ghatakon\nko chunate hain aur phir aap upakaran aur upakaranon ko chunate hain, theek hai aur\nphir ek baar jab aap un sabhee ka chayan kar lete hain, jab tak ki ve sabhee ek sarkit\nmein banane mein saksham hote hain aur unamen se koee bhee maujooda ka hissa nahin hota\nhai sarkit aapake paas aapaka paavar batan hoga aur yahee netavark banaata hai, vahaan\nse aap taaron ko do alag-alag taar shailiyon mein bana sakate hain ya theek nahin hai,\nvahaan se aap andar ja sakate hain aur sarkit ko sampaadit kar sakate hain aur ghatakon\nko jod aur hata sakate hain ya aap ek painal ka chayan kar sakate hain to ab aap painal\nka chayan kar sakate hain ya aap yahaan ke bheetar se painal ka chayan kar sakate hain,\nisase koee phark nahin padata, to aaie yahaan jaen aur kahen ki sarkit ek srot ko sampaadit\nkaren, main vahaan andar hoon, painal se chayan karana, ghatakon ko jodana aur hataana bahut\nsaral cheejen hain theek hai, samaapt karen aur hamaara kaam ho gaya, ab yadi aap is taib\ntaib par hovar karate hain, to theek hai, vahaan vidyut sarkit hai, lekin isaka naam\nagyaat hai, ek baar jab ham ise chunate hain, to ham ja sakate hain, oh, chalie klik karate\nhain, phir se koshish karate hain ki taib par ek baar klik karen, yah yahaan se pahala\nklik hai phir ham netavark mein jaate hain yahaan aur kaha gaya hai ki aap jaanate hain\nki painal ka chayan karen, nahin dekhen ki yahaan neeche kya hoga, yahaan vaapas mere\nyaantrik kaksh mein jaen, mere elapee par hovar karen, yahaan painal chunen aur yah\ntheek ho jaata hai aur ab yadi main yahaan vaapas neeche jaata hoon to aap aisa karenge. dhyaan den ki vahaan yah theek hai, sarkit\n13 phir se theek ho gaya hai aur jab mainne use phir se chuna hai, to main ise yahaan\nse chunakar kar sakata hoon, ise yahaan se chun sakata hoon aur main kah sakata hoon\nki sarkit ko sampaadit karen aur vahaan ke andar main vaayaring jodana chaahata hoon,\nmain bhool jaata hoon charan vahaan se radd ho gaya hai, aaie ise phir se prayaas karen,\nsarkit 13, yah bahut ooncha star hai, chalie bach nikalate hain kyonki vahaan alag-alag\nstar ka taib hai, ek baar yahaan chunen, yaheen par mujhe vaayaring ka vikalp milega, taar\njoden, theek par klik karen aur yah ho gaya hai is par ek vishaal hom ran hai, aap us\naadamee ko thoda peechhe kheench sakate hain, yahaan se is kanektar ko pakaden, main apane\nmadhy maus batan ka upayog karane ja raha hoon, jabaki main us kanektar aur pain ko\ndabae rakhata hoon, isalie main vaastav mein yahaan ek saath do anguliyon ka upayog kar\nraha hoon. aur mujhe saavadhaan rahana hoga kyonki mere\npaas vahaan ek aur nod hai, isalie main bas vahaan se chunoonga, is aadamee ko pun: konfigar\nkarane ke lie neeche kheenchen, mujhe yakeen nahin hai ki yah thoda sa bag hai ya nahin,\nlekin us hom ran ko theek karen, theek hai, hovar taib ek baar theek se chunen. hovar taib taib par phir se klik karen aapako\nalag-alag vikalp milenge theek hai aur ant mein yah aapako painal aur lod vargeekaran\naur sistam aur yahaan kee sabhee jaanakaaree bataega taaki mukhy roop se revit 2013 ka\nupayog karake hamaare revit emeepee parichay ko thoda sa samaapt kiya ja sake. ant mein revit 2014 ka svaad mujhe aasha hai\nki aapane is shrrnkhala mein kuchh seekha hai aur hamaare paas abhee aur bhee achchhee\ncheejen aanee baakee hain."

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"VideoID": "2085",

"Title": "How to design electrical systems with SOLIDWORKS Electrical",

"URL": "https://www.youtube.com/watch?v=uj-du0nkYos",

"Keyword": "Electrical system design",

"Transcript": "foreign we'll see how we can use SolidWorks electrical to design electrical systems with speed ease and accuracy We Begin by creating a line diagram this mode is optional we don't have to use it but it's a great tool for planning and given an overview of your electrical design we can add pictorial symbols to our sheet at the point we place the symbol down the component is added into our design and automatically given a unique mark we can also connect cables between the components and if need be Define point-to-point connections moving into the schematic tool we are looking to create a motor circuit like seen above we could copy and paste the circuit here but we'll start from scratch I'll draw my wires and insert my motor symbol I associate it to the motor that I placed in the line diagram as far as SolidWorks electrical is concerned we now have two representations of the motor M5 one in the line diagram and one in the schematic it's also possible to define a real-life manufacturer part SolidWorks electrical comes equipped with hundreds of electrical paths from various manufacturers to choose from better still if the part you want isn't in your database then you can download additional parts from the SolidWorks electrical content portal an online repository of millions of Parts it's also possible to create your own Parts too we can use filters to find the part we want to use When selecting a manufacturer part we are given visual feedback to validate the circuit information in the manufacturer part matches up with the symbol we've used to represent it we'll add in the circuit breaker contactor and terminal strip we can view the terminal strip in a tabular view and replace the wires connecting the motor with a cable circuit designs can be reused just save the circuit as a macro and it will be ready to drag and drop into any project origin destination arrows allow you to connect wires quickly and easily across sheets hyperlinks are generated so we can follow the wires through our project here we have a PLC we have a dedicated PLC tool that allows us to insert the circuits of a PLC across multiple Pages within our project we'll add in the unused circuits from PLC N1 on this sheet why numbering can be done at the click of a button we can use formula to drive the name and Convention of each wire type this can be a simple prefix and a counter or much more complicated if we want to plan our electrical cabinet we can use the 2D cabinet layout tool this will represent our components in an electrical cabinet and ensure we have enough space for our components rails and ducts [Music] to take this a step further we can also plan our electrical cabinet in 3D using the SolidWorks electrical 3D add-in we can place the components from our project into our design quickly and easily given that we have already defined how the components connect to each other in the schematic tool it's possible to Route our wires in 3D in a few clicks foreign our wires in the 3D allows us to calculate accurate lengths and duct filling ratios we can represent Wireless bills and materials and cable core lists in the forms of automatically generated reports and publish our project to Industry standard formats to summarize we can create intelligent line diagrams and schematics we have a comprehensive symbols Library we have hundreds of Manufacturers parts installed with the software but Millions more can be downloaded from the SolidWorks electrical content portal we have dedicated PLC and connector tools and we can do automatic y numbering 2D cabinet layouts allow us to plan our cabinet and we have SolidWorks electrical 3D to plan our cabinet and Route our wires we have comprehensive reports so wireless cable lists and bills and materials and we can output our project to Industry standard formats thank you for watching"

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{

"VideoID": "2093",

"Title": "Revit Electrical For Beginner - Complete House Project",

"URL": "https://www.youtube.com/watch?v=-VJQ4pi4GA4",

"Keyword": "Electrical system design",

"Transcript": "welcome guys investor today in this tutorial I'm going to show you how to do lighting and divot this is the second electrical tutorial that I'm going to create the previous tutorial was with voltage 120 and now I am going to create a better on with voltage 220 and first I'm going to work on corpulent and this plan I am going to select my outlet and place it down late and also how to create circuit and also how to select final board so let's start from here then sir go to all family u.s. metric and then elliptical from electrical MP then the trickle power and then terminal and from here I am going to select my receptacle 221 then open and now go to arc picture and then relation component when you select the reciprocal there is some city there is the elevation 46 centimeters from the floor so I'm not going to change this and also from here if you put receptacle to the the face you can change from here to put on the face or fourth blonde so I do need to change because I put on the vertical face so let's start and put the receptacle on the place I need to unzip tickle in here and also one I need in here I need one and here and also because lyric there is the kitchen I need the more receptacle in here and also I need one in here for the TB and also inside the row I need one in here one in here one here and here also I need one and this corridor okay and also I need one so as you know we need receptacle and the outside too so for the outside have to choose the water for 45 so now I'm going to sneak that if I go to the system from here electrical and then device and then select the elliptical fixture and from here now I am going to select that GFI duplex receptacle GFI this is before your protest there is a the sitting the elevation has one mithran 20 centimeter so I am going to float and 120 exact 120 so I need 1 receptacle and here one I need one in here 8 1 receptacle here and also I need to undeceive tikal and here beside their mirror ok and now as you can see this is the voltage of 220 so the Y receptacle GFI oh this is the width will tidge 120 so take one of them and then go to a date from here change the voltage 220 and then apply ok and now this also with matically there is change ok and now I'm going to select the right panel birth so again go to component from here I'm going to select this 100 with 100 min Bricker because I already know that my house is small and don't need too much power so I'm going to select this before you place it there is some sitting that this is the elevation also going to changes and also this the main breaker 100 and also this is the distribution that as 120 and 200 at work so this is the the voltage between the phase on natural and this is the voltage based went to face I'm not going to change this sitting and I am going to put my final word in here okay and now I'm going to create the circuit and connect to their pin elbow so when you click the one of the receptacle and then go to the power as you can see is there there is not panel Bull because the my pin Albert is still not assign it it means my receptacle is with the voltage of 220 and my panel world is still with voltage of 120 so how to fix this problem from here go to the system and then from electrical and then from here Electrical sitting and then from here there's I am sitting distribution system so in here now I have this in Albert so now I'm going to change the voltage and here I'm going to change want it between face-to-face to 420 and voltage between and lineup neutral or ground to 220 and then okay and now I'm going to get my circuit and connect to the network click one of the receptacle and then from here edit circuit and now I'm going to add some receptacle I'm going to add this one this one and this one and this one if you did any mistake and you can select this demo from circuit and then select this now it's a removed from circuit so I'm going to add this as well this five to one circuit and then from here select your final work this is your final birth and then then finish and now continue as the senators to Lake one of the receptacle and then go to power and then add a circuit to a circuit I'm going to add this one this one and this one and also this one one circuit and then from here holiday this is the panel board selected finish okay because this receptacle or and the catching and I'm not going to add more than two so I'm just going to add two active and once okay click one of them and then power again at this circuit and then I'm going to add only two because I need something put in here with more power so I don't want to for more than two in one circuit again for the GFI or waterproof each of them have to be in one circuit three days and then it is circuit this the panel already slated finish and then for this one as well I'm not at with this guy's the other because this is maybe I use something with high power so I don't need to adult - okay this is how to select receptacle panel board and carry a circuit so if you want to see the lake one of them and then put electrical and then see this is this guy and the one circuit connected to this panel board or if you create to the other one click this one and then go to electrical circuit and this show you which one is connected to each other and then if you want to know just click and go to circuit and this is this is how to select the receptacle panel board on how to create circuit and pivot and now I'm going to select the light so again from here go to an insult and then family from here I'm going to select this one and this one and then open and let's go to our picture listen component and then I'm going to take each one up there from here there is a different type so I'm going to select this below saying 277 volt ok this is the elevation so from here I'm going to change I'm going to power 350 because this is my ceiling is high is 350 so and then okay and now I am going to put on face not vertical firstly place on face then I'm going to put one here one here also for the etching and the center they've been here and one again yeah yeah like this I already know where as the place of the lightest so that's why I directly put if you don't know you have to find so because I work this all the day on what to cut - so that's why I know the place of the light okay one in here and also I when to brew it here the same light okay and now for the bottom and for here I'm going to fold one different maybe yeah yes sir and from here there is 60 watt 277 volt and also hundred watt I'm going to use this 60 watt and of course for the elevation again I'm going to change it to be 50 and fly and also from here I am going to put on the face so what Ford van and here the patrolman here I didn't use DRS waterproof because I don't have waterproof and my friendly that's why I only use this this kind of float if you have waterproof light/nur family you have to use water flow pan and the butter okay and now for the outside for the outside on the top of the door and here and here I I need also again go to answer family and then from here back then external so from here I'm going to use this one for the outside of fan then again go to company in place and from here I'm going to find that long I have to count 120 volt and 237 I am going to use this one and too late this one and from here as you can see this salvation and also I am going to turn to the clinic apply and of course I am going to put on vertical face so I'm going to put one the top of the door one here and one in and here yeah this is how to light and put a lot and now I'm going to select the suit on today I have in here and now I'm going to show you how to insert the suit or two system electrical and then device and from here if you collect their lighting suit I think and then there is a different kind of sweet so I need simple Pandey son I put in the vertical and for the elevation I'm going to put 125 okay and then I'm going to put one in here for this full light and one in here for this one and also for this six light one in here and also one in here for this five lights okay I need the waterproof switch for this outside and also for the shower from here go to family and from here back and then photo electrical and then MEP and then electrical power and then inside the terminal open terminal and then from here what are proofs which select this one and then open again go toward picture and place and company and this is the electrical the waterproof switch there is and now I'm going to pull on water probes to each this is a valuation again I am going to change this valuation to 150 because in the shower area and vitória you have to put and the high one in here for days and also one for this night maybe here okay I forgot to put one switch for this last I'm going to click this right click and then create similar and then I'm going to put 2 CH and here for this as well okay and now I'm going to connect my light to the suite and also create a circuit for the luck so as you know my pen'll birthday sweater voltage to 120 volt and my light there is different with a 277 mode so now I can connect my light to their pin Albert as you can see Lynne here there is not sure the panel would so how to fix this problem select the light and then go to that type and from here chained to the to 220 and then apply okay and also for this one also because this is different type and then chained to 220 apply ok and for the outside this like a swale and a voltage in here go to 10 to 220 then apply ok and now you can connect the light to the venerable so now I'm going to first cut it a circus like this one and then totally click on there at the circuit and then our delight I am going to add all of them because I know this is not too much power I'm going to add all of them to one circuit and then from here I'm going to select the final board and then finish a few now select this one of them and then go to electrical you can see this is all disconnected and then connector connected to their a network so now I'm going to correct the light to the switch the leg again one off the light and then select the switch and then from here flick a switch and then link this one yeah select this one of them and then three each and then they in the system this one to make this one this one again from here make the seat then finish and for this side I said because our next village that system and then for paste or Spain select this one select sweet and then edit 3-stone click this one thanks to it if you have funds which are non lightest and this later lot and answer next to each and then select search does that finish so again for this if there is none no need to what we did just next week yeah like this then again select this one select next wait days for this as well so it's sweet sweet our best night as when it's all dirty Johnny yeah if you want to know which this light connected to which do is just click this one and then from here sister they're sOooo does this light is connected this sweet if you want to know the circuit photo electricals like this and now you can see this all light connected to definite worth this are all one circuit okay this is how to select the light on how to select a sweet and also how to connect sweet to delight if you want to widen you can also do wearing so go to the system and from here electrical and then wiring there is the different kind of while talk for example I'm going to like this I'm not going to go where Indian this tutorial as it's not you can do widening like this okay if you want to know how how many circuit do you have and which light and it's reciprocal belongs to which circuit right click and then here and then go to browse and then system browsing and here electricals liquid critical and then power beside the you can see this is if you want to know which circuit one belongs to a rich one see this receptacle our circuit one circuit to this is from here this is a circuit tool and circuit is still kid 3 this two circuit for the circuit 5 in this one and circuit 6 is this one OK save honest this one socket line this one circuit 9 tests on the noticed this or the circuit night for example F is like this receptacle tasty this is this one and this receptacle this from here and also F is like this and here ok and now let's see how looks like the panel schedule from here god and here there's a panel schedule open this there is the circuit number and this the reverse that connected to the circuit and here phase ABC does circuit 1 and circuit 2 connected to phase a circuit 3 and circuit four connected to phase B and also circuit 5 the circus is connected to as Kelsey this is automatically created by the pivot so this is the total total load and phase a and phase B and phase C and also in here show they show us the total Lord with this connect device on an external life and also for receptacle they have three kinds of devices that use in this project and also and here there is the total load and this the estimated the total load and also in here there is daemon factor that this is how created the panel book with there a bit so if you leave the area that used the voltage 220 this is this tutorial is for you a few lives at least yours the voltage of 120 I have already created material with the voltage of 120 you can find and my channel ok if you like tutorial like this please subscribe the channel and also like the video to get more to turn like this so I think this is enough for this tutorial thanks for watching - your the liquid [Music]"

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"VideoID": "2108",

"Title": "⚡ How To Build An OFF GRID ELECTRICAL System In A Van ⚡ - Part 2 of 2 - Execution",

"URL": "https://www.youtube.com/watch?v=H6Gzgl53Htg",

"Keyword": "Electrical system design",

"Transcript": "what is up guys sevino savage here coming at you today with a brand new video today we are working on part two of this electrical series where we are going to be putting together our electrical system inside the van if you missed part one of this series i highly recommend you go back and watch that one part one covers all of the concepts that you need to know in order to understand what we're gonna be doing in this video we are going to keep the structure of this one exactly the same as we did last time so that you can mentally map the concepts from part one to the execution in part two we're gonna start with the batteries we're gonna move into the 12 volt dc system we're gonna go into the 120 volt ac system and then we're going to cover the battery chargers if you are new to the channel i am the kind of person who always comes up with tons of crazy ideas and to be able to turn those ideas into reality by knowing how to make them is one of the most empowering feelings that's what this channel is about is learning how to turn your ideas into reality if that is something that also interests you then slap that subscribe button below because we are going to keep making content speaking of making let's go ahead and make it happen so right now this is what our van looks like we finished most of the cabinets in here what we are going to be doing in this video is the brains of the electrical system which is all going to sit in this cabinet right here made out of 80 20. in fact everything in this van was actually framed out of 80 20. if you want to learn more about how to actually build stuff with that material i have a whole video on it on the channel just a warning this video is insanely long and it is insanely detailed i asked you guys in a post a few days ago if you wanted the long detailed version or the short abstract version and about 99 of people wanted the long detailed one so here we are it might make sense to do an overall recap of the system that's a much shorter less detailed video if nobody ends up watching this one because it's just too long then i'll probably do that we have six 170 amp hour batteries that brings us to over a thousand amp hours of total battery storage and did i mention that uh they're all lithium stop subscribe so i can pay rent next month this is more battery storage than i've ever seen in any van anywhere on the internet now i'm sure you guys can prove me wrong on that and i don't even have to ask you guys to put it in the comments in total these batteries weigh almost 300 pounds which is why they need to be really strongly secured in this cage here so that when this thing's off-roading they're not going anywhere the reason that i went with this many batteries is because in my last van i had 400 amp hours in total and they were just agm batteries and my number one biggest complaint about my last fan was that i didn't have enough electricity i might have gone just a wee bit overboard not to mention that agm batteries you can only drain to about 50 of their overall capacity before you permanently damage them whereas these bad boys the lithium ones you can drain 80 percent of the total capacity which means that in my last van i had about 200 amp hours of usable capacity where here i have about 800 amp hours the other awesome thing about lithium batteries is that they weigh way less than their agm counterparts so anyways let's go ahead and put all these batteries where they belong so we can get to wiring things up we got our battery bank in place here each one of these batteries has a positive and a negative connection as with any 12-volt battery and the first thing that we're going to do which i already did on these five as you can see is what's called a terminal fuse if there's a short between any of these batteries the terminal fuse will blow and stop the circuit you might be wondering well there are no loads between these batteries so how could there possibly be a short circuit that is exactly what i thought on my last fan until i accidentally dropped one of the battery cables and it bridged the positive and negative terminal and immediately melted the bolt and it scared the crap out of me each one of these terminal fuses is 300 amps the maximum amount of current that i expect to draw for my entire system at any given time the bms or battery management system that's built into each of these batteries would probably do this job anyway but not looking to test that one out again we have all of our terminal fuses in place next up we have to turn each one of these batteries into one big battery bank the way that we're gonna do that is connecting the batteries in parallel what that means is you connect all of the positives to each other and then you connect all of the negatives to each other we're gonna do that by making our own battery cables that are the perfect length to fit in between each one of these terminals you can definitely buy pre-built battery cables but it's actually way cheaper to make them yourself and with these super thick battery cables it is pretty important that they're the right length because they don't bend very easily before we get into this i have to make sure that you understand the risks and the dangers with doing anything electricity oriented in my last video i said you should just not do this yourself and you should hire a professional i no longer agree with that but i am not going to be liable for any harm or injury that you cause to anything at all you have to do this at your own risk all of this right here is the stuff that we're going to use to make our battery cables we have two spools of two ott wire two slash zero which is different than two gauge it's actually quite a bit thicker my favorite brand of wire is anchor for everything it's a marine brand and they make tinned copper cables so i don't know how well you're going to be able to see this on camera although these are copper strands they're coated with tin so they resist corrosion a lot better than regular copper wires do i'm putting links to all of these products in the video description below including the wire and all the tools that i'm using this is also the same stuff that's on my wiring diagram in the video description below this might be kind of silly to some of you guys but when i first got into this electrical stuff i didn't really understand that wire literally just met wire the red and the black wire are exactly the same it's just the color of plastic on the outside that helps us as humans interpret what that wire should be used for that's different the actual stuff inside the red and the black wire are exactly the same just wanted to throw that out there let's start by making just one cable for the positive side oh this one takes a little bit of force next thing we're gonna do is put one of these lugs onto this cable in order to do that we need to trim back some of the insulation thing about putting these lugs on is it's just as easy to take them off so what we need to do to permanently attach this lug to this piece of wire is called crimping it for these big wires you have to do something very different than what you do for crimping small wires for any wires that are bigger than like an 8 gauge or so you want to use a big wire crimper rather than those little handheld ones that brings us to this bad boy right here this is a massive hydraulic wire crimper i think it was about 80 bucks pretty expensive ridiculously heavy it weighs like 20 pounds there's a much cheaper version of this which is a wire crimping anvil i'll put a link to both of them in the description below you just start cranking on it like this you got to give it a little bit of muscle and boom just like that we have a perfect wire crimp on this two watt cable it is insanely strong i'm pretty sure you could hang from this and it just wouldn't come off now we've got ourselves a fully functioning battery cable it would work perfectly in its current form but we can do one more step to make it look professional we are going to put a piece of heat shrink around it it comes in all different shapes and sizes for different sizes of wire all that you have to do is slide it on like this and then you take your heat gun and you heat it up for a little while surprise surprise our heat shrink actually shrunk if you look really closely you can see this heat shrink has glue in it already it's heat activated glue our battery cable is complete let's go ahead and try it out so we finished all of our battery cables and we now have one giant connected battery bank there's a link to these renergie lithium batteries in the video description below next up we have to run a wire from our battery bank to our electrical panel which is going to live down here all righty we got our piece of wood it is loosely bolted and placed before we actually attach this battery bank to anything on that board i just showed you guys we have to install this master on off switch and this master 300 amp fuse somewhere on the front side of this panel so that it's easily accessible if there's ever an emergency i can just open the rear doors and flip it off alrighty our first component is installed here it is a switch that comes directly off the positive side of our battery bank there's just a long wire that gets routed through the bottom here it comes up into this 300 amp breaker which goes into the input side of the switch i'm using a 300 amp breaker because this is kind of a 300 amp system right we have 300 amp terminal fuses there and all of our hardware is going to support 300 amps this is a 3000 watt inverter so i can run this inverter and use some of my dc devices without blowing these fuse now that we've got our battery connected to the input side of the switch we need to connect this output side somewhere now this is where our bus bars come into play now that we've got the bus bars mounted all we have to do is route the output from this switch to the positive bus bar don't forget to turn it off we got the switch connected to the positive bus bar now we have to do is take our negative and bring it back to the negative bus bar here the reason i'm taking the negative on this battery and not on this one is because we want the current to run through the whole battery bank if i were to just hook up this negative terminal here most of the current would be flowing right here and it would pull some from the back but not nearly as well as if we do front to back now before we take our bus bars and start powering all of the things we need to ground our negative bus bar to the chassis of the vehicle so even though this is going to be what's called a floating electrical system meaning that all of the current in the system is flowing through wires that we're adding to it we still want to grab it to the chassis just in case we like cross wires with the mercedes system and just for general safety reasons i'm choosing this location right here because it's actually twice as thick as the other metal in the same area it's pinch welded to the rest of the wheel well very very sturdy ground location before we actually start drilling we're going to take our dremel and we're going to clear off the paint in the clear coat so that we expose the bare steel of the location that we're trying to drill through so now we've got our nice exposed steel grounding location let's go ahead and attach the wire of course i got the wrong size nut back to the hardware store i think this is the cheapest i've ever made it out of the hardware store since this is the only hole in the entire van that we're going to drill and not put paint on afterwards i want to make sure that we're not going to get any rust over time or any sort of corrosion we're going to spray this stuff on it right here it's actually meant for electrical components and preventing corrosion in the long run you can find this at your local hardware store but i'll also put a link to it in the description below it's a nice secure large surface area connection into a really sturdy part of the frame now that we've got that hooked up we can test it out by doing something pretty cool we have our multimeter here we can take the positive side touch it to the positive side on our switch take the negative side and touch it to any bare metal in the van whatsoever the same 13.2 volts is flowing all the way through the van back to our battery bank so now that we've got our big ground wire coming all the way around and attached to our negative bus bar we are finally ready to start actually connecting devices as we covered in part one of this video we don't want to directly connect the bus bars to all of our devices we need to have some means of protected distribution where we can have fuses on all of the wires that are going out to those devices what we're going to do is connect the bus bars to two 12-volt fuse boxes here the only reason i have two is because i might end up having more locations being used than are available on just one of these and there we go we got our two 12 volt fuse boxes ready to go we have two big negative cables these are four aug around the back of this board attached to the bus bar right here as well as two positive cables with also four aug each one of these fuse blocks can carry i think 80 amps or 100 amps i can't quite remember but i have 100 amp breakers in front of them to make sure that each one does not pull too much current individually let's test things out with our handy dandy multimeter first we gotta turn the system on and if we check positive to negative here we got ourselves 13.2 volts if i take my hand off goes back to zero on back to 13.2 now we have a ton of places that we can put individual 12 volt devices there's positives here which have their fuses and then negatives for each device let's start with an easy one we have this max fan that we've completely installed and it has its positive and negative hanging off see if we can make it work so the way that we are going to get this wire down through the side of the van and into the electrical system with this little guy called a fish tape basically it is a fairly oh almost dropped it fairly rigid piece of steel that you can finagle your way basically i'm gonna go through this oh my god look at that b no no don't nest in here hey what the hell maybe you just tried to start a hive this fish tape goes down through the side you can then tie your wire to it and pull the wire back out makes it way easier to get wires in these small places so once you get down to working with this 14 gauge wire things get a lot easier first step that you got to do is just remove the outer insulation that covers both the wires with a knife once you're done with that you have both the black and the red wire exposed you want to take one of these electrical wrench thingies electrical pliers i don't know i'll put a link to these in the description below they let you crimp and cut like 22 all the way down to 10 gauge which is pretty much all of the small stuff that we're going to be doing we want to remove enough of the insulation on both sides of these that we can join them together so we take the insulation removing part of our pliers here and we cut off enough insulation these are the quick disconnect insulated jointers i really like to work with these they're really simple this is what they look like there's just one male and one female side and all you got to do is attach them together to create an electrical connection and we're going to crimp our wire ends on each of the sides to do the crimping we can use these same multi-purpose primers we're going to find the section for insulated terminal crimping we're going to go down to the 14 gauge and we're going to crimp one of these to each side it's pretty confusing but on this fan the black is actually the positive i don't know why they did that but because it is labeled positive we're gonna connect it to our red wire and the white to our black wire and now we are going to go on this side now we need to do is take our cable here pass it behind the walls back around and into one of the locations on our 12 volt fuse box the reason i have these quick disconnects as opposed to these standard kind of permanent butt connectors is exactly for this reason right here i've threaded this wire all the way down and navigated it but i realized that i actually need to put this behind the beam here so with these bad boys i can just disconnect it and reroute it no problem by the way these quick disconnect connectors are also great for anything like switches that have these metal pins on the back ends up looking like this and i use these for all of my switches and relays anything with these pins sticking off of it on this side of the wire it's pretty similar to the side we did up there now this time around since we're not joining two wires together we're instead mounting these wires to the fuse block we need a bit of a different connector i like to use these same anchor branded terminal connectors first thing we do is just slide over the top same as the previous connectors we're going to use our same crimping location for insulated 14 gauge make sure it's strong which it is we are going to connect our positive and negatives to the first location on this fuse box and i actually don't have any fuses i need to order some in the mail thankfully it does come with one this is a 15 amp fuse which i would not use for this fan i think i would use a 7 amp i can't remember the number i'll put it on the screen right now you want to be pretty tight nice and snug same thing for the negative we're just going to take the first location here let's call it this one it actually doesn't matter which negative location you use they're all the same exact negative connection and just like that we have our first hopefully functional circuit let's turn it on and see if it works oh power button hey let's get it this is the moment when you really feel like you're some sort of thomas edison who just invented a light bulb very satisfied right now super stoked this works something else i learned is that if you do have multiple max fans one remote works for all of the fans that you have that's definitely going to get frustrating i can already tell before this next step i think it's probably important to give some context of what the kind of end result of this electrical system is going to look like the idea is to put our control panel where we're going to see our battery monitor our water tank levels have all the switches for turning things on and off in the van right here located above our comfy seat we have two options we can either run the wires up and over the roof back down and into the battery bank or we can run them down through the bottom of the van and up and the last fan i did run the wires over through the roof it's definitely not a bad option it worked pretty well but the main reason i decided to do that was so that i didn't have to drill any holes when in reality you have to drill holes either way if you're going to go over the roof or through the floor you have to drill holes through somewhere now that i know that i think it's actually going to be simpler to just drill two holes through the bottom of the van and run the wires underneath when you run them over the ceiling you have to take your whole ceiling off anytime you want to change that wiring and that brings us to the absolute worst part of this electrical install we have to drill holes in the floor of the van first we're gonna start with a small hole just to make sure that we didn't miss the mark hey let's go we got the perfect location time to use the big daddy i definitely recommend using full on goggles when you're drilling up underneath the van because all that crap falls straight into your face check it out guys we got ourselves a perfect three inch hole by the way the reason you want to start from the bottom of the hole and then finish from the top is to abide by an old drake saying i've started from the bottom now we're here you want to finish from the top so that it's a nice clean cut downwards and it doesn't have any blowout last step we're going to rust protect that hole that we just cut by spray painting it with this this right here is what our pass-through contraption looks like we have the cable boot with a little plastic ring on it i fabricated this piece of aluminum by cutting a three inch whole-ish kind of shape on the back side we have some weather stripping this is three-quarter inch it needs to be thick enough to fill in those ribs on the bottom of the van there are going to be big screws placed through these corners up into the floor of the van and then we have six small tapped bolt holes in here these are 8 32 tapped bolt holes you can see the threads those six threaded holes are going to allow us to mount this cable boot so if you want a really good ab workout i suggest you install something like this getting this thing installed into this crevice was way harder than i anticipated it literally took me like four hours of basically doing sit-ups so this right here is how it turned out guys i am super stoked with how it's looking here not only is it super super secure but as you can see that weather stripping is conforming to the underside of the van so we have a perfectly sealed waterproof cable entry it's going to be really easy to either add wires or remove wires because all we gotta do is change that zip tie out but now we are finally good to run wires across the van so on the driver side of the van here we have finally completed our wire highway it starts from this cable boot right here which is just in front of the shower and into the cable boot that's just in front of the electrical bay now that our wire highway is built it's really easy to just run all of our wires in this exact same way by the way we are going to put some conduit on the outside of our wire so don't worry we're not going to leave them like this the first two wires that we ran underneath the van in that wire highway are this max air fan that's in the front of the van as well as the wires attached to our lights on the roof rack next project is also a biggie and that is hooking up the ceiling lights this front zone is going to be turned on with this nifty light switch that i have installed right here this is a dimmer switch it's kind of a low profile version this right here is the diagram for it so you can see they have a black that goes to ground but then they also have a red that goes to the ground on the lights and a white that somehow goes to positive i think this is really confusing because most switches kind of intercept the positive wire and the thing here is that this switch actually intercepts the negative wire so what i'm going to do is actually bridge the two positive wires one that goes out to the lights and the one that goes into the battery bank and then leave the two ground wires separate one of the ground wires goes to the lights one of them goes to the battery bank that gives us three positions in total the light is now dangling attached to that one wire let's go ahead and see if it works hey we got full-on damage baby you want to hook up all your lights in parallel so that if one of the bulbs goes out it doesn't turn all of them off that means that each connection requires you to bridge it with the next lights connection so this right here is what each connection ends up looking like by the way these lights are super low power they draw like 200 milliamps this entire front section of lights is gonna draw less than two amps of power so 14 gauge wire is way overkill but i have a massive spool of 250 feet of it so i thought i might as well just use that all right we got all of the front lights working with this switch right here and then coming into the back i have the switch dangling right now because i don't know exactly where i'm going to place it it turns the lights on back here which i only have three of right now because i do need to order more of them but the whole circuit's working and we are good to go on lights we just got the fridge connected it actually works which i am very pleased about because i am well outside of the return window it was super simple literally just a positive and negative to this fuse block like all of the other 12 volt accessories it's a little dirty up here right now but we have our six baja designs lights we have them attached with the waterproof connectors and then they go into these cable clams directly through the roof i put a little zika flex on top of them i'll put a link to these cable clamps in the description below i think this is the best way to run wires through the roof of the van they go through the roof and come out through the insulation right here we have them running back inside of the wall here into our cabinet where we have them run down down down and then out through the cable boot i did use the massive harnesses that come with the baja design lights i've had the lights mounted for months and i've never actually turned them on because we needed to attach them to our house battery bank rather than the cars they drain way too much amperage so when it gets dark tonight i'm going to turn these puppies on and show you guys what they look like [Music] so it's been about two days since the last clip i filmed we still have those three wiring harnesses that are coming from the roof there but trying to get these three wiring harnesses actually turning on the lights has proven extremely challenging holy cow guys you have no idea how stoked i am right now i finally got the light working boom remote switch we can hook this puppy up to the dash that took me way longer than i originally thought it would low beams hi beams look at that spotlight it literally is so great the entire area here looks like daylight so the challenge is i was using the harnesses that you can buy alongside the baja designs lights these come from them but since i have six of those lights i had to cut all the harnesses apart and kind of jerry-rig my own logic in there and the strangest part about it was that the signal wire to this relay was causing those lights to give like a low voltage signal where they go and it was just the signal wire to the relay so it caused me so much confusion i had to track down with the whole system as far as where the voltage drop was actually occurring and i finally found that it was on the signal wire which shouldn't be doing anything anyways what i did is i hooked up a second relay after their relay that has signal wires that don't require a ton of amperage to go through them if i would have just rigged these things up without their wiring harness to begin with it probably would have been a lot easier so relays are a whole separate concept that i didn't cover in part one of the electrical series the main reason you use this piece of hardware right here a relay is if you want a lot of power to a device but you want to power that device from somewhere very different you also want to use relay if you just have a massive amperage device that you want to switch on and off typically your switches can only support about 10 or 15 amps so if you need to use that switch to turn on something that takes 300 amps you basically connect that switch to the relay and then when the relay sees that the switch is on it connects the power wires to each other so you can pass 300 amps through the relay and still only pass like one or two amps through the switch don't let that confuse you you're probably not going to need relays i didn't use a single relay in my first van so as part of this endeavor for the lights i actually hooked up another sub panel in the tall cabinet this sub panel is connected to the batteries with massive two aug wire that big two og wire goes out through the bottom of the van gets run underneath and it's connected to our big bus bars the reason i did this is very similar to the reason you'd hook up a sub panel in a house i basically have a ton of connections in the front of the van here i have all the lights on the roof i have my fan above me i'm also going to put a couple of outlets down here instead of running all of this stuff out through the bottom of the van and back to the 12-volt fuse boxes over there i decided to put a 12-volt fuse box here so that we could run much shorter lengths of wire for all those accessories by the way this is still super messy i'm just so stoked that i finally got these lights working that i thought i'd film it now we are going to clean this up and bundle all the wires nicely so we're currently taking all of those wires that we powered from the sub panel that we installed running them underneath the floor back up through the bottom of the driver's seat with the factory boot and then we want to run them up so that we can power them from the dash here while we're driving anytime you get anywhere close to the oem factory wiring your brain just about explodes it is all super super annoying on my first van i didn't touch this stuff at all i did not bother to run the switches all the way to the dash and instead i just switched them from the back so we have all of these switches wired up to the dash here these are the oem factory dash switches i actually ordered some custom dash switches that slot in here and we'll be able to accept these pins for now i tested it all with these temporary switches and everything is working great next up we have a super exciting part of this project which is going to be the electrical control panel this is gonna be the thing that we're actually using on a day-to-day basis unlike all that complicated stuff inside the cabinet the idea is that we're gonna have a nice door we can swing out to use all of the stuff in there so i'm gonna pull this panel down and we're gonna build a box real quick the way that we're building this electrical panel i have this box which sits permanently on this face of the cabinet and then we have this false back that's going to be screwed in inside of here where we can mount all of our electronics to so anytime i have to go in here to do maintenance or to add anything all i have to do is pop this false back out and i can do my work there pop it back in there's not too much work needed to change things up and then we're gonna have this door that opens up to expose all of the electronics take a look at how it turned out obviously i'm gonna need to repaint this right here i gave up on that pretty quick as far as trying to keep it in perfect condition and we have to do a bunch more finishing touches such as uh fix all these mistakes but if you ignore those this is completely functional and it actually works really really well we got the ac controller we got the heater controller we got the max fan controller inverter switch all of our 12 volt dc switches battery monitor that actually just hooks to our phone via bluetooth and water tank gauge the very last 12 volt dc device that we're installing in this video is the cell signal booster i put it behind the microwave because i had quite a bit of extra space i thought i could put some devices back there this one is the selfie go x it's supposed to be the best one available there are a few different connections for cell signal boosters the first one is the antenna that i currently just have out the door back there onto the roof it's just a magnetic antenna that's a temporary solution until i get a full on and mounting system that's what grabs the signal from the cell towers puts it into this device the device amplifies it and then you have an inside antenna this guy right here that i just have taped to my beam that's what broadcasts the signal inside of your van so that your cell phone can connect to it and then obviously you have power which i've hooked to that 12-volt fuse box and we have a nice switch that we can turn it on and off here you can see my fancy label that switch for our cell signal booster is the most basic version of a switch that you could possibly have the way that it is run this black wire is the wire that connects directly to the cell signal booster that came with it i cut it down and stripped off the two ends instead of attaching the positive of the cell signal booster to the 12-volt fuse box directly i took the positive routed it to this cable which i have back to the switch this intercepts the positive this goes to the switch all the way back out and the other side of the switch is attached to power so that when the switch turns on we get power through this wire and up into the cell booster then we just have the ground cable which is this one right here same as all the other ground cables okay we are finally done with all of the 12 volt dc devices most of the work is in that part of the system because that's where you end up routing all of your distribution we're also going to be hooking up a lot more 12-volt devices as the build progresses all the other 12-volt devices that we end up hooking up one positive one negative to either of the dc fuse boxes and we are good to go next up we are going to install this inverter which is going to power all of the 120 volt accessories inside of the van for us that means things like the water heater the microwave and all the 120 volt outlets ours is a 3 000 watt renergie inverter charger we'll basically need to mount that to the 80 20 right there and then run the distribution out to a 120 volt ac panel that we're gonna put right here it's very similar to how we ran our dc distribution to these 12 volt dc fuse blocks alrighty so we have made some progress on the inverter here we have the input from the battery bank the positive and negative input those go directly to the buff bars and we have our first output here so this looks like a big cable but it's really just a round version of three cables the hot neutral and ground that is 10 gauge because it is powering our entire ac distribution panel and that all works i can go ahead and show you guys this is the remote switch for the inverter here and when i turn it on it beeps annoyingly for a few seconds and then you can see our ac voltage works so outlets are pretty simple they're just labeled hot on one side neutral on the other side and then you have your ground location there all you got to do is strip your wires and attach them to each location the other side of our wire is just attached back to that 120 volt fuse box that we talked about the microwave is very easy as well we have just bought an extension cord from the hardware store the shortest one we could find cut off the female side of it we crimped it to our 320 volt wires the same way we crimp all the other 120 volt wires i know it might be surprising for some of you who are brand new to this i was like holy crap 120 volt ac extension cords are literally just the same three wires but anyways we can now plug this in to the plug that comes with the microwave and we run the wire all the way down into our 120 volt ac distribution box link to this microwave in the video description below it's actually the smallest width microwave that i could find anywhere on the internet by the way have i mentioned yet how absolutely amazing it is that i can simply pull off these panels in like 30 seconds you can tell that the person who built the van is also the person who owns the van when your panels look like this bolts that wraps it up for all the 120 volt ac devices let's move on to the final section that's going to use both the 120 volt system and the 12 volt system the battery chargers the next thing that i want to hook up is the ac input this is going to allow me to charge my battery bank before we get the solar panels installed which is going to be a different video step one we gotta run this same 10 3 wire out through the bottom of the van towards the back so we've got our wire run all the way to the back of the van here as far as shore power goes most people will actually drill a hole in the side of their van and put a small panel i did not want to drill a hole in the side and have that panel be visible because i feel like it kind of gives off that rv look and i want to go for something a little bit like stealthier note that this van is stealth by any means but i think it's gonna look a lot better if there's not a big plastic panel on the side of the van so what we are gonna do as you can kind of allude to with where this wire is coming out is put a recessed hidden shore power inlet underneath the van here we're going to use three components to build our shore power inlet this is a marine co 30 amp stainless steel inlet with three prongs there we then have this waterproof aluminum box that we just bought off mcmaster i'm going to attach the inlet to this side of the box so that we can connect our wires inside of this little waterproof location and then in the back of the box we're going to drill another hole and put a nipple that our cable is going to go through i will put a link to these three parts in the video description below and there we go we have completed it you can barely see it on the bottom right there which is the intention i actually broke this stainless latch so i have to order a new one ignore that but we have our box it's completely water sealed we have the wire coming in the back that gets routed up to the inverter and what you're going to do when i get a new one of these is you twist it you open it you're going to be able to plug your power in you can see i have the three wires rounded through there through a cable gland in the back that's all water tight more brokenness and uh yeah we're good to go i might paint this black at some point and maybe this as well but i have so much stuff to do on the van right now that i can't dedicate the time to that so when it's closed this thing is about three inches higher than the bottom of the spare tire carrier that i don't have my spare tire in because i have it on the back and it's about two inches higher than the bottom of the exhaust basically it's a little bit lower than the bumper but if you're gonna need this extra inch and a half of clearance on the off-roading you're doing you're gonna mess up your bumper anyway if you don't care about departure angle you can actually mount this even farther down and more out so that it's easier to see when you want to plug your outlet into it for me this is the perfect location all right let's plug in the power and see how it looks so now if we come over and look at the input we can see that it absolutely has voltage coming through it and when we look at the app for the bluetooth battery monitor it is also showing that we're gaining about 85 amps of power right now so we finally have a good way to charge our batteries that actually went pretty smoothly on to the next thing i know a lot of you are probably watching this video just waiting for the solar install and i have some bad news i'm going to do the solar as a separate video it's a big enough project on its own that i haven't started that being said we do have the solar charger mounted with the two breakers one for the input and one for the output it's really simple you have a positive and negative for the input of your solar panels and a positive and negative for the output to your batteries the solar charger does the rest i put mine in the same cabinet right behind the microwave we finally got our very last charger installed and that is the dc to dc battery charger i am using a renegy 60 amp battery charger which i have fastened on the back side of this cabinet here right next to our sub panel the input side to this battery to battery charger is connected underneath up and to the oem mercedes battery we have one positive going to the positive terminal of that battery and we have the negative going directly to the negative terminal of that battery i actually have the car battery running up to these two bus bars right here so this is actually the positive from the car battery and the negative from the car battery i can use these two bus bars connected to the car battery anytime i want to draw power from there instead of my battery bank i left some space here because i might put something like a trickle charger that takes power from the house battery and puts it into the car battery so that my car battery never dies on the output side of our dc to dc charger we just have it hooked up to the positive and negative bus bars that we ran to this sub panel from our house battery so the output side of this charger is effectively attached to the positive and negative terminals of our house battery very last connection on this dc to dc charger is this dangling wire that i haven't zip tied anywhere yet this wire just goes to the switch it's going to be on this oem looking dash switch once i get these things in the mail so that when i sit down and i turn my car on i can switch the dc to dc charger on and it'll be powering my house battery bank and then when i turn the car off and i want to park i can simply switch that switch from the driver's seat 60 amps is definitely the absolute maximum you should be using as far as a charger in the sprinter vans in fact it's a little bit higher than what they recommend i believe it's capped at 50 amp that being said i'm never going to turn this thing on when i don't have the car running and when the car is running the alternator is pumping a ton more power into the battery when i turn it on it will always be pulling primarily from the alternator believe it or not guys that sums up the entirety of our electrical project i will be connecting more devices as this build progresses like when we do the water system we will attach the water heater but for now we are 100 done and i am very happy to be saying that because this was a massive massive project i took hours and hours worth of footage we'll see how long the video ends up being it's going to be really hard to condense all of this footage down into a short enough video to be valuable for you guys so i hope you enjoyed this video i hope that you learned something if you did slap that like button below to show me that you guys liked it makes me feel a lot better about myself and if you are not yet a subscriber i would greatly appreciate you slapping that subscribe button that will let you get notified anytime i drop a new build video thank you guys so much for watching and i will see you guys next time"

},

{

"VideoID": "2109",

"Title": "WHY EARTHING IS NECESSARY IN ELECTRICAL SYSTEM?||FULLY EXPLAIN||",

"URL": "https://www.youtube.com/watch?v=1oLOZYXLaIA",

"Keyword": "Electrical system design",

"Transcript": "have you ever been shocked when you touched an electrical home appliance such as fridge TV oven ouch well then you already know something about the effects of electricity you know what happened and why because your device properly not connected to the earthing if you liked this video please subscribe our channel learning engineering firstly we see in fortune a sea of earthing earthing provides the safety of the personnel from the electric shock it ensures that the non currents carrying parts such as equipment frames are always safe at ground potential even though the insulation fails earthing is essential for the safety of the equipment and personnel against lightning and voltage surges providing the discharge path for surge arresters gaps and other similar devices it provides the ground connections for the ground neutral system it provides a means of positively discharging and the energizing feeders or equipment before proceeding with maintenance on them more information about the earthing system so please visit our website wwlp.com we already seen the unfortunate see of earthing and now we'll see what is earthing how do work earthing system Electrical Engineering drowning or earthing is the reference point in an electrical circuit from which voltages are measured a common return path for electric current or a direct physical connection to the earth the method of connecting non current-carrying parts of the electrical equipment or the neutral point of the supply system to the earth through the wire having negligible resistance is called electrical earthing earthing protects the electrical equipment from lightning strokes and earth fault conditions it provides the easiest path to the fault or leakage current to flow through it earth and can be done by electrically connecting the respective parts in the installation to some system of electrical conductors or electrodes placed near the soil or below the ground level your home electrical system not provide earthing connection in case your device connect to the live when you touched an electrical home appliance such as fridge metallic body you get shocked because the fault occurs the fault current from the equipment flows through your body to ground on the other hand when your home electrical system provide a proper earthing connection the fault occurs the fault current from the equipment flows through the earthing system to the earth and thereby protect the equipment from the fault current you not get shocked and you safe thanks for watching this video any question and confusion write the comment box don't forget like share and comment more update please subscribe our channel learning engineering"

},

{

"VideoID": "2114",

"Title": "Top 7 Electrical Engineering Projects 2022 | DIY Electrical Ideas",

"URL": "https://www.youtube.com/watch?v=tjbv\_BLChnQ",

"Keyword": "Electrical system design",

"Transcript": "solar power bank with wireless charging the purpose of a power bank is to recharge battery powered electronics when you're on the go but even power banks need charging charging a power bank while you're traveling is not possible due to lack of electricity well this solar power band with wireless charging can be used when you are in an isolated area [Music] she [Music] solar wireless electric vehicle charging system electric vehicles have now hit the road worldwide and are slowly growing in numbers the only problem electric car owners face is the unavailability of charging station and long charging hours let us check out this solar powered electric vehicle charging system this system demonstrates how electric vehicles can be charged while moving on the road eliminating the need to stop for charging so using this mechanism the vehicle when it moves over the road it does not need to stop for charging and it is charged continuously as it goes over the road so these coils are connected to a transformer which is used to power them how basically the system works in the solar panel you can as you can see here is used to charge the battery using charge controllers so the charge from the battery is converted to ac power using the transformer because for wireless transmission we need the power to be ac power and after the power is transmitted from the coils on the road it is received by the coil underneath the vehicle and this received power is again converted into dc so that it can be used to charge the vehicle battery so now let's move the vehicle over the track and as you can see as it moves over the road the power is transferred wirelessly to the circuit and as you can see the box of the vehicle is made to be transparent and the coil that is mounted inside the vehicle is used to power vehicle circuit and also show the voltage generated so here we can see the voltage that is generated received at the vehicle end as it moves over the road so this is how the system works e-bike speed controller system electric bikes are gradually taking over the fuel-based bikes as it is more environment friendly let us look at this new system which controls the speed of an e-bike as per its throttle so the throttle acts like a potentiometer okay which is the input of which is fed to the htm 32 microcontroller and based on that the controller will operate the dc motor the control will increase the speed and as the speed increases and the wheel speed increases and we have a sensor here it is a ir based sensor which is used to measure the speed the measured speed is then displayed on the oled display using the stm22 controller so let's increase the throttle we have increased it to the maximum and now let's decrease it gradually so as you can see as we decrease the throttle the speed keeps on decreasing until it hits reaches zero power efficient mini inverter project inverters are widely used in domestic as well as industrial environments to serve as a second line of source in case of power cut from the electricity utility grids let us check out this mini inverter project let's assume that we are facing a power failure and the inverter is off so the load remains off now let's turn on the inverter as you can see the inverter converts dc to ac to power the load also there is provision for charging the battery the user simply needs to plug in the adapter here for charging the battery contactless switch for for load switching home automation has made life easy now everything is contactless but for switching off the load that has to be done manually but with this new system we can switch off the load without any contact [Music] foreign [Music] [Music] protecting induction motor for phase and temperature for industries three-phase supply sequence is used and knowing the phase sequence is very important so let us look at the system of protecting induction motor for phase and temperature these are the transformer connections that we have shown for face so this was phase one this is phase two and this is phase three so all the loads are on that means the induction motor is basically will now turn on and suppose if any of one of the face goes out it is denoted by the blinking led which shows that phase 2 is out and therefore the induction motor has turned off dual axis solar tracking system with weather sensor solar energy is renewable and will never run out unlike other sources of energy let us look at this new dual axis solar tracking system with weather sensor this system can increase energy by tracking sun rays from switching solar panels in various directions [Music] so [Music] uh [Music] you"

},

{

"VideoID": "2171",

"Title": "Electrical Questions for Interview 2024 | Electrical Interviews |Questions for Electrical Interview",

"URL": "https://www.youtube.com/watch?v=5WbsZegjKKE",

"Keyword": "Electrical system design",

"Transcript": "oh [Music] question what is the purpose e [Music] what is a three-phase power supply and why is it used in industrial settings a three-phase power supply uses three alternating currents each phase 120° out of phase with the others it provides a constant and balanced power flow which is more efficient for heavy loads and Industrial Equipment three-phase power reduces the electrical load on each phase providing higher efficiency less wiring and the ability to power large Motors e thanks for watching if you found this video helpful don't forget to give it a thumbs up and subscribe to our channel for more industry specific interview tips and career advice hit the notification Bell so you never miss an update if you have any questions or topics you'd like us to cover drop them in the comments below we're here to help you succeed in your steel industry career check out our other videos for more insights and stay tuned for upcoming content good luck with your interview and see you in the next video"

},

{

"VideoID": "2193",

"Title": "Revit Electrical Cable Tray Draw Practice",

"URL": "https://www.youtube.com/watch?v=hTe9aVNKBTg",

"Keyword": "Electrical system design",

"Transcript": "Hello friends welcome back to my YouTube channel today I'm showing some exercise for draw cable tray in rate so this is some of the panels and how we can draw the cable tray so this is for new beginners so how to place the panel I will show you one more time so if you go to system tab then take electrical equipments from here so then you can get lot of uh panel whichever you whichever family you have you can get it that one for example I'm using this smdb and I'm placing one xdb over here and another one I'm placing here and even even if you required over here so here maybe there will be no space to open this this one so I can um move it this one like this and copy like this and I just need to make another smdb like that so for example if you have to give a panel name this one so just select this one and go to in the property bar you can get here panel name so for example I'm just giving this name smdb smdb 02 sorry smdb just type smdb 02 and this one I'm just giving name smdb 0 smdb smdb 0 3 and this one I can give a name smdb 04 and this is already I think having one number like uh I can change this one asdb 01 and this one I can give a um 05 smdb 05 like that and uh and we need to give the tag for this one just TG for the tag and you can give the tag like this simply you can give the tag like this just give me give the tag tagging like that you can just give the tag for DBS and everything like this you can stretch it and beautifully you can arrange it and this one also you can give the tag like that and even for this one also you can give the tag like this and stretch it like that and even for this one also you can give the tag like this and this one also you can give the tag like that so automatically it will come so how to draw the cable tray so cable tray if you need to do I have created one view template over here so from The View template you can go to here filter so just need to add um different uh cable TR filters over here so I have another video for that how to create a filters and and everything so that you can uh look it for my video section otherwise I will give the link in the descriptions how to filter this things and I'm just clicking okay and I need to draw a cable tray for example if you need to draw a cable tray go to the system tab from this the draw panel you can take the cable tray from here so for example if you need a 600 mm cable tray you just need to choose the 600 mm cable tray and it is coming from this panel just uh then you need to change the service type first so I'm just giving like a service type one and then I just need to draw cable tray like this so for example it is going like the this way and it is automatically coming like that and you can draw the cable tray like this up to the Riser so simply you can make the cable tray like this and if even the keyboard arrow down key down down arrow you can choose that one and if you go to the 3D view just you can see the cable tray is running like this and then uh then you need to drop the cable TR means you can just come up over here and just stretch it this one and just go to here and go to view and you can drop the cable tray from here like this draw cable tray and just drop to the panel so that was correct so then then you can go to the 3D view you can see the uh that was dropping to the panel also so other cable tray I need to run another cable tray so just go to here and if you want to change the size of the cable TR 450 then you need to change the service type for example this is two and then you just need to run a cable tray from here just click on over here and just uh run through the cable tray like this and uh you can come up over here and you can drop up to here other cable tray also you can do the same thing like you can change the um LV type 3 and it is coming from here and just need to uh drop run the cable tray like this so you can draw the cable tray wherever you required so if you need to take a branch then select this one and create similar then you can create a similar and you can make a cable tray like this and if you want to change the size of the cable tray again then you select it from here and make it as a 300 so automatically what will happen the reducer will come and you can draw the cable tray wherever you required so if you want to change the um the height of the cable tray so you can change this one from here 3,500 so I'm just giving that one so just give like that and I think this is also the level is different so just we need to change the level uh for example I'm just changing ing this level to 3,000 3,000 so we can see delete the elements so just we can see how it's work and uh we just need to see how how it's run uh see the cable trays are there but this cable tray I think this one also in different level so just need to change that one so if you go to the 3D view just see all the cable trays are coming up in the um same levels or different levels like that so this cable TR is different level so how we can um um connect that one you can go to the top view of the 3D View and then select this one and pick it over here and just uh drop drop connected to that so the different level it will come and and the same thing like another cable tray un need means create similar and this will we can say like be 4 and the change this one like uh uh we can say like 750 mm so it will come from here and um for example here you need to come here and just need to cross like this so automatically it will it will come like that and uh if you want to run like this so the cable tray will run like this so you can move it this one little bit uh like this and you can see the how how it's run you just need need to go to uh look the 3D so you can see clearly you can see the cable tray is running like that so if you need to arrange different layer of the cable tray so what we can do we just need to take a sections so over here just move the sections and go to view and you can see here the cable so you need above one more cable tray so just copy this one and just make it how much distance you required you can make it that one and if you can look the 3D view so you can see all the cable trays running like that but uh the the cable tray it was this is the cable tray in the top level so it was it was not connect not come to here so just need to draw cable tray from here and just come up over here and just you need to enter the electrical room so you can do it like that so if you if you look in the 3D view so some clashes you will be get right uh maybe it was not clashing with another another cable tray so now wor so it will come like that so the all the cable tray you can um drop down to the panels also sorry just select the like this and you can uh drop to the panel also so how to drop the panel you need to make a sections first so just go to the section and just go to view and you can drop the cable tray from here draw cable tray and just need to drop the panel like this and if you can see that uh it was in the uh in dropping to the panel right uh so like that we can make a different different cable trays in um in rate so just need to take a branch then create similar and you can just take a branch like this so automatically what will happen the T Junctions will be developed and you can go to the 3D view it will be look like that and if you stretch it down so you can clearly see the cable trays are going like that from here from here you want to make a another uh Branch so create similar then uh we just need to make a a different C Branch you need so you can take that one for example 450 mm cable to the this lift so you can make it like that so automatically that will create so this is the one method and for example um um you need to give some other um cable TR branches over here also you can give the cable like draw cable tray you just need to take the cable tray like this and then um you can make up to here and again you need to change the size so you can just make it like this and it will come like that and if if you need to change the elevations so you can make the elevation different elevations and you can connect it to wherever you required so if you look in the 3D view so automatically the bend will be come up over there so maybe some Dex or something like passing means you can make it like that the overall the 3D view you can see it's over here so you can clearly see all the cable trays are running like that so simple exercise those who are working in the RIT so if you like my video we just need to uh just need to um support me and uh like my videos and if you have any comments please comment in my comment box thanks for watching thank you"

},

{

"VideoID": "2206",

"Title": "No Problems, Only Solutions! #construction #electrical #electricalwiring",

"URL": "https://www.youtube.com/watch?v=ik9InKhgFRs",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "my task of the day get all them down that little hole over there life is full of curveballs no matter what life frows at you take it with strive use it to Define and mold you into the soldier God intended you to be take pride in your work and remember there is no problems only solutions no matter what life throws at you today you can endure it consider subscribing and mash that like button"

},

{

"VideoID": "2212",

"Title": "#electrician #constructioncompany #pnw #fyp #electrician #electrical #construction #troubleshooting",

"URL": "https://www.youtube.com/watch?v=dtcdzy4A\_Fk",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "for"

},

{

"VideoID": "2220",

"Title": "🤣💦 problems of underground electrical. #construction #work #dirtwork #electrician",

"URL": "https://www.youtube.com/watch?v=eGVHuUV3v5E",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "come with me and you'll be in a world of Osha violations"

},

{

"VideoID": "2225",

"Title": "Electrical nightmare! #electrical #construction #bluecollar #youtubeshorts",

"URL": "https://www.youtube.com/watch?v=c0vrZn33vAs",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "so this right here is what you call an absolute electrician nightmare nobody wants to deal with this we got corrosion up here oxidation who the wants to deal with that me get some rusted ass break is in this this"

},

{

"VideoID": "2247",

"Title": "New construction inspection with electrical issues",

"URL": "https://www.youtube.com/watch?v=9atpXgY-7Rg",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "all right why don't y'all come on this fun Journey with me figuring out why this breaker won't reset and if you're already guessing yeah this is new construction right there so it automatically is popping so let's keep that off follow me that controls the living room [Music] all right let's reset that everything's still off now we can reset [Applause] voila we got power but do we have power outside because now we had to turn that GFCI off nope it's off now we got to reset it well y'all can't see but yep there we go just trip the breaker again and there you are just another reason to get your new construction home inspected because you're not gonna have power on your patio or in your living room"

},

{

"VideoID": "2250",

"Title": "250kcmil termination #electric #construction #quality #electrcian",

"URL": "https://www.youtube.com/watch?v=MSdkmiqwxOI",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "[Music] hey see I'm F To Go Beast mod and the rest of them know how I'm rocking they know how I'm popping they say I'm a cheat C the king of the mon the biggest they know they in trouble when I get a feast mode really been on this world for some Years everybody want but can't take what I give better watch you say you get what you feel I'm the biggest whever is up cuz I'm here on the island I'm wild don't think that I'm hiding every time I come out and get heck I'm the king of the jungle the island everywhere that I stump you know I give respect think you better than me let's check it out you ain't for the fight better ex now come on with the beef your the T can't eat what we eat I'm"

},

{

"VideoID": "2279",

"Title": "How not to install plugs #shorts #electrical #electrician #work #diy #youtubeshorts #construction",

"URL": "https://www.youtube.com/watch?v=H8FqmMZJVAY",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "I've noticed that a lot of electricians out there like to backstab their switches or plugs and by that I mean that they like to put the wire in the hole where it's supposed to go in really not supposed to come back out I personally don't like doing that because I've had a lot of problems with that in the past where the wire slips out of the switch or the plug and then half of the circuit stops working or that one light stops working or that one plugs off's working and then we get a lot of complaints from homeowners and it's not good I had a guy call me about two years ago saying that half his house didn't have power so I came out I looked at it and then I told him that I had to open every plug and every switch make sure that everything was right he said that it was okay he had two electricians out there and they wanted to charge him to rewire the whole house I told them that was nonsense as soon as I opened up the first plug I found that the wire is going to the rest of the house were not hooked up to the plug they had slipped out so I looped all the wires around the screws and since then I haven't heard from that guy of course that house was very old that plug was probably the first plug that was put into that house it took a very long time for a wire to slip"

},

{

"VideoID": "2328",

"Title": "hackers!! #electrician #electrical #milwaukee #klein #construction #eaton #fml #apprentice #fired",

"URL": "https://www.youtube.com/watch?v=hGK0rEqewn4",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "gotta love the things you find when you start ripping up floorboards old knob and tube they were actually using it after they renovated the kitchen at one point changing it all out now"

},

{

"VideoID": "2338",

"Title": "Switch with MCB install #engineering #electrician #construction #electricalcontractor #electric",

"URL": "https://www.youtube.com/watch?v=rOH6l\_tMAKs",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "foreign [Music]"

},

{

"VideoID": "2339",

"Title": "Sloppy electrical work on new construction furnace! #homeinspector #hvac #homeimprovement",

"URL": "https://www.youtube.com/watch?v=\_BRdPXwVNKY",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "another brand new construction Helm today and check out this electrical for the furnace I don't like it nice sharp edge de for that to get cut on and have a nice short sloppy work right here guys"

},

{

"VideoID": "2357",

"Title": "How to flash electrical mast. #roofing #construction #homeimprovement #diy #educational #tips",

"URL": "https://www.youtube.com/watch?v=-dkccM0h9AM",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "let's talk about an electrical Mast this is an electrical Mast so these wires Supply power to this building below me now when it comes to the flashing we see this done wrong all the time just like right here so that's a plain pipe boot with some type of weird collar it's very old it's rusted looks like galvanized KN when the this roof is getting replaced you have to use something like this this is called a split boot it fits a bunch of different sizes but what you do is you cut out the size of the diameter of this pipe and it actually slides if I can get it with one hand it actually will fit around there it'll fit in the hole that you cut and then you use these clamps to actually clamp it together we see a lot of roofers using standard pipe boots and what they'll do is they'll cut the pipe boot and actually seal it with some type of sealant or something and hopes you know that it doesn't leak and it will always eventually leak when you're getting a roof make sure your roofer is using split boots thanks"

},

{

"VideoID": "2371",

"Title": "Electrical Issues Continued - Lennar Homes Construction Issues - 6111 Yeats Manor Drive",

"URL": "https://www.youtube.com/watch?v=7z3qj5-9Exs",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "so I walk in the house 5 49. I cannot turn the fans on uh and I'm willing to bet bedroom is like the not a surprise it actually works so let's go check out the fuse box and I'm willing to get there is something that is tripped if so this would be the third time in a week yep [Music] and now this side of the wall and the lights come back on this is my world"

},

{

"VideoID": "2377",

"Title": "Electric pipe line fixing / #viral #shorts #building #shortvideo #construction #skills #engineer",

"URL": "https://www.youtube.com/watch?v=FDaR7t3Dn9M",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "foreign [Music]"

},

{

"VideoID": "2389",

"Title": "You better call a professional! #diy #construction #electrical #funny #comedy #tiktok #explorepage",

"URL": "https://www.youtube.com/watch?v=l3FQGC5LGBA",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "[Music] foreign"

},

{

"VideoID": "2399",

"Title": "#electrician #construction #electrical #brakerepair #promaster #ram #work",

"URL": "https://www.youtube.com/watch?v=261P673lOcc",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "Sunday morning dealing with some maintenance on the truck just change the brakes there's our front pads they're right ready to be changed so now I'm going to work on some other things on the truck little organization stuff perfect thanks"

},

{

"VideoID": "2418",

"Title": "8-24-20 3:08pm Artique Construction Electrical Issues with switches, outlets, faceplates",

"URL": "https://www.youtube.com/watch?v=4lQkI2zx2s8",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "okay back to the video um august 24th 308. so again switches so um the flow uh if you're going to be coming out and this is this is probably going to be a light that's going to be on frequently because it is a main hall light it illuminates um basically three main areas like the living room the kitchen and the hallway there so this light is probably going to be on pretty often so just thinking about the flow and you know having people live living you know living upstairs and staying upstairs and so forth just the other night you know just closing down closing off all the lights and i noticed that you know this light it would have been should have a switch here where you can you can close the light from here because if you are you know if you're the last one in on the on this floor and you're everywhere and you want to close off all the lights you're going to need this light to actually get to the stairs because the the the next light is up there it's going to be dark and so this one so this is where the this is the mystery switch the mystery switch is really this like you know how many times where joe kept asking like what is this or where and it's just like i don't know you why don't you guys note it before demoing it this just shows you how um disorganized everything is i mean i didn't i'm sorry but there's a certain point where you realize when you hire a general contractor you're basically hiring them to take care of the job and to do the project management i mean if all you're going to do is just tell people hire people to say just go do it then i should have every right to just go to some random you know electrician or you know uh handyman say just do it and just and just be like okay i'm just i'm just happy with that i'm not paying a premium just to to to project manage and babysit this project that's not the purpose of it i am a person that wants to get this done i i am a real estate investor i'm looking for to rent out this property and the carrying cost of this property i mean gary does not does not care it's funny because he told me his son is into rental properties but he doesn't seem to take that into consideration given that this product started may 15. talk to any any flipper renovator things people from that that that space to do interior home 30 days and that's already being generous the ones that are really that really can that can really knock it out it's usually 24 days so this is really unacceptable and i feel bad for um his clients that have to deal with this shoddy level work they might not even realize it until other people point it out and really it's an embarrassment um so this is this light switch and plate covers look at this it's it's just this bows out and just makes me wonder what's going on here right what's going on so going up the stairs we had two outlets here they decided to take one away and the switches as electrician pointed out from the last line switch is reversed and he's like and joe's response was well it's a multi-way switch that's not the point of course it's a multi-way switch that's not the point the point is is that this is supposed to be there i mean it's like again the devil's in the details if if simple things like this are not being carefully done mean give this to any child they could tell you oh this should probably be flipped around then you know what about the things that are behind the wall now that concerns me because there has been already violations called out from the electrical so i completely do not trust um i'm basically the electrician feels bad for me because i'm paying i'm going to be paying double for electrical work because we need to redo his um shoddy work um people should really shouldn't be paying him for any electrical work it's uh as you can see just even from the surface it's it's not even it's not even it doesn't even look good so there's another switch here so this plate this is it here um i'm a little disappointed here with the paint job like yeah not not that good but this this is actually supposed to be one switch the reason why it's two because of a box issue and i don't know how else to describe it but there's really no reason this was always one switch it's because they made too much of a hole and they didn't want to spend the time for someone to patch it and and take care of it or it had to do with the box that was installed because the box was for double not a single but it's always been a single here that they did this so this is one of their oops and this this is a oops that if if yeah if it was like that from the beginning then yeah i totally get it you know you do oops because because um you want to you want to you want to hide something that is um that was already there but they created this this was created by rt construction this was created by garrett and smith and his crew they made a mistake and they had to oops this all the other rooms do not have this all the other rooms did not have this so this is on them this is on them and their sloppiness and that's why i want to sever my relationship because i don't trust his work his work is this and he's not even here to inspect it and if he's putting so much trust into who he hires to do this work then have him do it right that's all i'm going to say about that i mean here this outlet is is okay it's fine another outlet here this is flush a little more flush kind of out here but it's fine just a little dirty wipe it up this one this one's okay this one's fine this little boat out on one end this right here is like this um it's it's it's to the side and if you could tell it's suicide it's not flush this is a little more flush but it's more down so up is a little more out and then the bottom is not so it's it kind of has this weird effect um this one this outlet it's okay it's it's a little more even but still has its issues um this yeah again too much to the left i mean you never know right that's that is thick enough to have like a end of a paper clip to go in there or a small wire to go in there because it's not it's just not done it's just not done nice let's see no outlets in the closet good here moving on to outlets in the bathroom this is this is okay it's more flush actually actually it's actually quite decent it's actually satisfactory so see this it just has this right here stuff no bowing no not so much bowing this the outlet is okay it's fine it's flush it's actually quite almost almost even almost level flat this one's a bit one of the better ones and this one the back this is a moot point i guess because it's behind it's but it's pretty even it's it's it's out more but it's it's even it's it's level from the surface this outlet is fine this is how the outlet's supposed to be in the other room not the one with the extra i'm going to see how we could correct that this is the mystery outlet that was working it was not working hold wires probably the cause this outlet goes in not even this is pretty flush here pretty flat but i don't know why this is bone-in maybe we just need to loosen the screws a little bit this outlet is kind of weird to me um it's weird because of all the the paint job just uh it just looks bad and you really need to even this out make it look nicer um yeah it just needs a little more attention it just looks uh looks it doesn't look good outlets here be used take this out this is pretty uneven to the right here this sticks out the place plate is actually quite flush but the outlet is not now here oh this is one of the the more bad ones look at that it looks like you could turn it right it looks so so in here i mean really stuff can get stuck in there and it's just this is this is what upsets me it's like they don't care um they just want to get it done and um this is not this is not this is not this one you can see it's it's a little more it's like the other one but it's not as prominent okay how rough that is right there the paint job is pretty rough um also this i don't know what this is this is yeah that needs to be addressed painting issue i mean the scuff marks this is our final outlet here i know this looks a little sk yeah okay this is this is almost done this is a little flat little pointed and that's that's it"

},

{

"VideoID": "2421",

"Title": "#electric wrench #auto repair#tower crane#construction machinery #shelf worker #diy #cuttingwork #",

"URL": "https://www.youtube.com/watch?v=6LnCiCUMJQA",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "thank you"

},

{

"VideoID": "2428",

"Title": "Fire lite bg 12 #alarm #alarmsystem #construction #diy #firealarm #chill #electrical #electrician",

"URL": "https://www.youtube.com/watch?v=IN3NPDNNv\_0",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "hi guys I just got a brand new pool station as we can see right here it's a fire light bg12 yeah that's the bg12 model this is the bg12 I've got it for really it was not expensive the only thing that was broken is this and it didn't come with the XR so I keep it unlock but let's go and pull it now let's going and reset it's pretty hard to go and reset one hand ouch my stuck that it's that and you can now pull it"

},

{

"VideoID": "2434",

"Title": "Electrical Meme / #electrician #plumbing #hvac #maintenance #construction",

"URL": "https://www.youtube.com/watch?v=2vwGmLa4NiQ",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "oh i'm in favor of execution maybe maybe our entire team needs to be executed after tonight i mean we just"

},

{

"VideoID": "2445",

"Title": "our equipments provide the electricity for outdoor night-lighting pipeline repair construction",

"URL": "https://www.youtube.com/watch?v=gfKIRfMO8G0",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "and it goes like this Save Me by the Tongue and I know you kiss me till your drunk and I'll show you all the moves like dagger I've got them moves like dagger I've got them moves Jagger I don't need to try to control you look into my eyes and I own you with the moves like Jagger I've got the moves like Jagger I've got the mov ooh sler [Music]"

},

{

"VideoID": "2447",

"Title": "#electrical #electrician #building #house #work #light #construction #concrete #steel इन्वर्टर कैसे",

"URL": "https://www.youtube.com/watch?v=kqk9txZzDPk",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "call she smile on her face she with roll"

},

{

"VideoID": "2456",

"Title": "electric wiring comercial construction management system work#shorts #status",

"URL": "https://www.youtube.com/watch?v=JrZaRIV\_H44",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "[Music] oh you"

},

{

"VideoID": "2486",

"Title": "#electric wrench #shelf worker#Auto Repair#Construction Machinery #tower #cuttingwork #diy #",

"URL": "https://www.youtube.com/watch?v=ww2NsIlAIjE",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "la"

},

{

"VideoID": "2533",

"Title": "How to connect single phase wiring #viralvideo #electrical #electricity #electrician #construction #",

"URL": "https://www.youtube.com/watch?v=Qlm3-HtQtf4",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "and the supply is off now in order to perform the wiring I've now chosen my three load circuits this over here is going to be my lighting circuit this is going to be fed to my socket outlet and this over here is going to be for my stove in this lab we use flexible wire that is stranded the reason we do this is because we reuse the wires for each demonstration in your case you will probably be using solid core cable please take note that if you are using stranded wire it's very important to twist the strands one can also use a boot lace type feral and you can crimp that to make sure that the strands do not open when you are fastening it into a terminal for the remainder of this demonstration I will be using these flexible wires now for my light circuit I'm just choosing a circuit breaker that is 10 amps so I have my 10 amp circuit breaker there I'm then going to have my socket Outlet circuit which is going to have a 20 amp"

},

{

"VideoID": "2617",

"Title": "#fire #electrician #electrical #diy #hvac #construction #america #fun #automobile #nicetruck",

"URL": "https://www.youtube.com/watch?v=IQrJJBjjXi0",

"Keyword": "Electrical troubleshooting in construction",

"Transcript": "uh who' you say did the electrical work oh that would be my nephew Thomas he's very handy uh what year did his House burn down about 2 years ago how do you know his house burned down had a feeling"

},

{

"VideoID": "2631",

"Title": "Electrical Conduit Installation | Built to Last TV - The Green Home",

"URL": "https://www.youtube.com/watch?v=Z7Akm2gLxz0",

"Keyword": "Electrical conduit installation",

"Transcript": "our next job is to finish installing the conduit and run the electrical wiring throughout the home our electrical contractors in the process of completing a lot of the rough from work on the interior of the house quite a bit of it was done before the Mason got on site because we have a lot of the boxes and places for our exterior like fixtures and outlets so now they're focusing their attention to the inside we have quite a bit of Conda with the run because we have a home automation system in this house and because of the local code requirements all our wiring has to be in conduit so we have to run a lot of extra piping in the house and they are in the process of now getting done once that's completing in place they can start pulling the wiring and start getting things trimmed out stuff to go you"

},

{

"VideoID": "2632",

"Title": "Electrical Installation INNOVATION - Multiple conduit saddles from CONDUBITS - #shorts",

"URL": "https://www.youtube.com/watch?v=rvUlnrCuzew",

"Keyword": "Electrical conduit installation",

"Transcript": "you"

},

{

"VideoID": "2644",

"Title": "Electrical Conduit Improperly Installed On New Roof - Improper Roof Repairs",

"URL": "https://www.youtube.com/watch?v=HADMBCGxzrU",

"Keyword": "Electrical conduit installation",

"Transcript": "here's another example of improper work on a flat roof this is electrical conduit with high amperage wires running through it for the air conditioning it does not belong sitting on the roof it's supposed to be on stands 9 in off the roof uh the way it is it can blow in the rain go back and forth it's sitting in water as you can see the roof pwns water it's a safety hazard as well as an inferior job which causes damage to the roof"

},

{

"VideoID": "2651",

"Title": "Can Romex Cable be run Through Conduit? National Electrical Code Book",

"URL": "https://www.youtube.com/watch?v=OeuWsYy6bvE",

"Keyword": "Electrical conduit installation",

"Transcript": "[Music] [Applause] [Music] hello and hey howdy man today we've got some technical stuff but it's going to be good don't zone out i see already nodding here's what some of you do young electricians hey we'll talk about the code nec code code requirements it's like shooting you with a trunk dart all of a sudden you're you're out well don't do that so today we're gonna have a brief discussion and you guys and homeowners too man this is all the time can we run romex inside of conduit and man i've seen this and it comes up on inspections but look you homeowners especially you love to put romex inside a conduit can you do that legally some of you old guys will say no you can never put romex in conduit so here we go here's what i'm going to tell you go to the book okay go to the book hang on grab your code book and here we go so romex article 334 says hey this is where you can and can't use this stuff so one of the places that pertains this in article 334 is you can't use this outdoors or in damp or wet locations romex isn't made for outside so that's all it says so it doesn't say we can't use it inside of conduit so if we're in a garage like here running surface mount let's say emt we could run romex inside of that no issues okay now here's the two things it's just two don't zone out i touched the code book some of you already just fell off you probably did yourself a harm two things um article 34334 again talks about not using it in damp or wet locations so not outside here's the other place you're doing a kitchen remodel you're pulling power underground to a kitchen island when you pull wire through that pipe it should either be th hhn or thw individual wires or uf cable not romex here's why article 300.5 b says basically code is fairly recently that any underground conduit is considered a wet or a damp location so as soon as we pull that 12 2 or 12 3 underground to that island even though it's inside the kitchen inside the house once it's underground it's a wet location red tag can't do it okay so no no wet damp locations the second thing is we have to talk about conduit fill and we ignore this all the time here's what that means if you go to chapter 9 which is tables at the end of your code book it'll talk about the percentage of fill in other words what percentage of a pipe this cross section right here what percentage of this is that wire allowed to fill up by code if we undo it you know let's at least know what we're doing we used to always do it basically if it fits it goes old guys will remember this if it fits it ships not really code compliant it does work so in chapter 9 table 1 it says for a single conductor it's not supposed to fill up more than 53 percent of this and i won't go into the math i'll put myself to sleep but here's the thing a multi-cable conductor like romex is considered because it's sheathed it's not individual it has to be considered one conductor so whatever this cross section is in this whole cable is how the code wants you to approach that so last i did the math if i have a 12 2 which this isn't you see the red so 12 3. 12 2 i have to put that in a three quarter inch conduit okay now beyond that there's other issues if you have multiple romexes over 24 inches of conduit you have to derate it that's different problem so here's the thing you can run a single romex through conduit different kinds of conduit as long as it's not in a damper wet location and as long as you don't exceed the fill you don't overfill that conduit the conduit is large enough otherwise it can go okay now i've seen lots of comments on other threads and places i've gone it's like oh you have to use wire individual conductors and to be honest my opinion i think you should it's easier to pull you can pull stuff through in the future but a lot of times if you're transitioning from flush hidden work like through the attic when you're coming out into surface pipe it's easier just to transition and go through the pipe versus doing a j box and pulling individual wires and having another splice so the point is by code you can you just gotta meet those two criteria for what we're describing so let me know in the comments when you guys see this you old guys i'd love to argue with you um our primary code sections are of course article 334 for romex um article 300.5 as far as underground or their their location for wiring methods for what's damp and wet locate locations and then in chapter nine you guys can go the book here we go see if you're awake enough look at that ah you're still awake chapter nine notes number five and nine talk about how we apply the fill to a multi-conductor cable so anyways homeowners do it right if you're gonna do this and save yourself a bunch of money and not call an electrician do it right electricians newbies go the book everybody respects your opinions and you're great here not really go to the book start the book go from there y'all click subscribe i want to see you guys i want to see that click like and i mean i am so looking forward to your questions because there's going to be some questions take care"

},

{

"VideoID": "2662",

"Title": "Your Guide to Installing Electrical Conduit",

"URL": "https://www.youtube.com/watch?v=yHJS9Tg8ip8",

"Keyword": "Electrical conduit installation",

"Transcript": "electrical conduit or duck is usually made of plastic or metal through which electrical wires run here are the steps for installing one for installing an electrical conduit prior knowledge and information is required but by following the proper steps and with some knowledge even a novice can install it the duct must be installed before the installation of conductors it must always run in a straight and direct way but if more than two ducts have to be installed in a parallel fashion next to each other it is better to install them at the same time the minimum size Raceway that can be installed is half an inch to install underground electrical conduit you need to take the ground at least 18 inches deep steps method one materials requires are one inch metallic conduit metallic couplings and one hole strap at first mark the place where you want to install your duct start with the panel of the house at the top of the panel remove the knockout feel and fit a 1-inch coupling inside it while doing this make sure that the power is disconnected from the coupling or cover the breakers and the top feed section with a cardboard bend the conduit with a 1-inch bender set the anchor on the wall at a distance of 10 feet for concrete anchoring use plastic anchor or wedge anchors Karia till it reaches the end in the box where the conduit is present check if everything is in place and secured method 2 materials required are EMT conduit conduit bender set screw couplings offset fittings electrical boxes deburring tool tape measure pencil hacksaw set screw elbows single hole or double hole straps screws electrical fish tapes screwdriver and electrical tape see electrical boxes on the wall and determine the end points of the conduit set the boxes screw them and add offset settings fix the conduit firmly against the wall after knowing the path of the conduit measure it with a tape measure mark with a pencil and then cut with a hacksaw with a deburring tool remove the burrs present at the end of the conduit attach the continent to the wall with single flash double hole straps and screws allow the fish tape to pass through the conduit path when the endpoint is reached tape the end of fish tape to the end of electrical wires through conduit pull the wires in place lesson 3 this method is used to install PVC conduit for an outside circuit but it is different from installing underground PVC electrical conduit fittings materials required are PVC and pound fitting plastic clamps adhesive cutter or hacksaw hammer drill and fish tape to start with drill a hole such that it can accommodate and pound fitting drill it above the foundation of your house or shed cut the PVC in such a way that it will extend to your house or shade up to one inch force it in the hole join the end with an adhesive and attach the pound fitting force the entire pound fitting in such a way that it is flushed with the wall below the pound fitting dig a trench making its width equal to that of a shovel it should be minimum 18 inches deep cut the PVC conduit in such a way that it can be attached to the pound fitting and reaches the bottom of the trench while doing this enough room should be left for the elbow attach the elbow with the adhesive and also attach the PVC into the pound fitting with adhesives cut the entire length of the PVC conduit and fit it into the trench with the help of adhesive after it has dried place it in the ditch and glue it with the end of the elbow attach the entire length with plastic clamps drill into the foundation and insert plastic shields so that all the screws are held in place clamped a PVC conduit to the shed or foundation of your house using these simple methods you will not have any problems installing an electrical conduit you can also ensure electrical safety from wires and exposed locations the above methods can also be used for the installation of commercial electrical conduit they not only protect your circuitry but also make it look neat and tidy"

},

{

"VideoID": "2667",

"Title": "Easy Steps To Installing Electrical Conduit Underground With Conduit #electrical",

"URL": "https://www.youtube.com/watch?v=xyEJqN0WIAw",

"Keyword": "Electrical conduit installation",

"Transcript": "hello and welcome to another sleepy dog construction video today's video shows you how to install underground electrical conduits the contractor has placed nine six-inch conduits the conduits are approximately eight feet deep and will be covered with red concrete hi chewie welcome to another sleepy dog video can you tell us what you got going on today uh we're going to pour concrete from the [Music] six inch conduit for electric or electrical and now the concrete doesn't have to be a special color yes sir it's gonna be great great concrete so state law requires that it is red for future contractors that dig they'll see the red contract and understand this electrical underneath it and how many yards you gonna pour today okay is it there's no reinforcement or anything like that in this you just pour it which is unfortunate okay well chewy i appreciate it and uh i'm gonna video and watch y'all do your magic thank you thank you the concrete truck is arrived and has 10 yards of red concrete the concrete is a three thousand psi mix this means the concrete should achieve a compressive strength of three thousand pounds per square inch in seven days as you can see the concrete has more of a burgundy color the red concrete is required backfill for all electrical conduits in the future if a contractor excavates here they will see the colored concrete and know there's a buried electrical conduit here the concrete is required to cover all the conduits and have a final fill of 12 inches above the top of the conduits the contractor is required to vibrate the concrete to prevent air pockets and make sure the concrete is being placed between and under the conduits here we're looking from a different angle let me zoom in and get you a closer look [Music] here's a look at what's been poured so far the seal plates are in the way of the concrete truck chute so the contractor will fill the track hole bucket and place the concrete that way the red concrete has been setting up for several hours so it's time for the contractor to remove the trench safety the worker connects the steel plate and the tractor will lift the heavy plate out of the way [Music] the track hole makes it look so easy the operator will stack the plates on the roadway they will need them later today here's a look at the concrete it looks a little more red after curing now it's time to backfill the trench the intersection must be open for the weekend the operator places the dirt in the trench and pushes it down with the bucket this will compact the dirt to 95 of drive density which will be verified by the lab man at a later date [Music] here's a look at the end of the day you can see the end of the conduits [Music] the trench has been secured with fencing to prevent animals from falling in the hole the steel plates a contractor was using for trend safety are now used to open up the intersection now you know how to install electrical conduit please like the video leave a comment and subscribe to the channel so you won't miss any future videos thank you for watching and have a great day"

},

{

"VideoID": "2685",

"Title": "beginner electrical conduit install. it&#39;s the little things!",

"URL": "https://www.youtube.com/watch?v=PJOTR4MtHek",

"Keyword": "Electrical conduit installation",

"Transcript": "oh okay well here's another example when we're working how just keep it neat and clean I'm not gonna go over bending pipe just yet just showing you one of the jobs that I'm working on and it's all expose piping like us talking about your level I got the pipe hanging down there's nothing connected to it like so put it against the wall I've already got my strap in there I've got my box connected to it and right in between the bubble take my black marker dot a dot and a dot I've got my spaces for how many spaces but you know marking where I want my stuff so want my anchoring points what had you asked me to get technical C end of the day I'm ready to go home I like working eight hours very lazy he's gonna connect a few little babies right here I'm at Home Depot I didn't know what they're made out of cast aluminum something rather these work perfect move the pipe over put it right on your mark put it right in your drill screw right in two boxes the two holes for the box you're marked out it's uh it's almost well it's idiot-proof but that difference between a little little neater work just a couple of seconds just to put up to put a level on something means everything so these guys wouldn't people I'm using me if my stuff wasn't the cleanest around and it is on the best level perfect it's amazing how right in between those bubbles see that it's different between good and great I've tried to hire on guys and I can't even believe how they walk away from something just garbage so when I'm done or a little further along I'll give you another progress report starving electrician Oh signing off"

},

{

"VideoID": "2688",

"Title": "InsideOut® Underdecking Electrical Conduit Installation Point",

"URL": "https://www.youtube.com/watch?v=qOgehsIG\_DA",

"Keyword": "Electrical conduit installation",

"Transcript": "[Music] hey there I'm Ian from quality edge in this quick video is to show you on an inside out under deck installation where your electrical conduit is coming through the panel in most cases you don't want to have an opening in this part of the panel because water is flowing through here I've drilled a 7/8 inch hole to fit 3/4 inch conduit right here this will be attached to a joist conduit just comes down right this way all the way to the fixtures hanging on the joist where my hand is and all you need to seal is that small opening where the conduit is coming through the panel your lighter fan fixture will then simply attach with this pancake box that is usually part of the lighter fan and screw right up flush to the bottom of the panels there you go [Music] [Music]"

},

{

"VideoID": "2691",

"Title": "The Easiest Way To Pull Large Gauge Electrical Wires Through Conduit",

"URL": "https://www.youtube.com/watch?v=SsdC6nZXhdg",

"Keyword": "Electrical conduit installation",

"Transcript": "first and foremost guys make sure that you have the power turned off you do not want to be working in a live box so take precaution before you start this project next up you will need fish tape pullers in our case we ran into a snag which we're going to show you in the video we actually needed two fish tape pullers i will have these linked in the description box below the video where you guys can pick them up yourself save you a trip out to the store this is what's called a wire pulling lubricant and sometimes we have a harder pull you can use this we didn't need it for this particular pull but it is available at all of your home improvement stores electrical supply stores etc now we're fishing the fish tape fishing the fish tape through the conduit inserted here this is the first step here this is what we did before we just fished the fish tape and these things are handier than sliced bread so you fish it first and then you pull it or it's out of steel so it pushes pretty good and i oversized this conduit to make it easy to pull you can also get the conduit size off of tables that are readily available on the internet because depending on the type of insulation the number and size of wires will determine all right we're going to go outside here but we're going to show you exactly what we did here we have a fish tape puller that is coming out of the conduit out of the box here and as you can see this little latch is on here at the end of it coming down to our little hook here now what my dad is doing is the technique that he uses okay so in his hand is a number six and what he's actually doing is he's actually stripping the wire and then actually cutting off some of the wire so he's unbraiding it and then hooking it around so it's not completely thick two more wires to put on and i couldn't fit them all in there in this little eyelet here this is a technique that most electricians use as you can see here that's where he has cut off some of his wiring and we're going to put two more wires on here just like that and then we're going to tape it and this is the white these two will be the black 220 between them this is the neutral white coated that way and i'll also add a number eight ground all three of these wires are number sixes and um you'll be fed off of this power panel off of a 70 amp breaker you can you can look at the google national uh electric amperage tables to determine your size of wire that you need this is an inch and a quarter a pvc conduit it goes underneath this house and then outside it drops underneath the ground uh supposed to be eight in 18 inches burial comes up there's two what they call lbb lb fittings we'll show you that when we get outside so this is the technique he does he just strips the wire and then he'll cut off after he unbraids it like we just mentioned so you're able to hook all four wires through that hook and then we'll go ahead and tape it we'll show you that and pull it through and as you can see each one gets longer we're going to be staggering them so we do have to strip off more wire each one to be able to stagger them as this one up here is higher up than this one and then the next one will be lower and lower once again electrical taping the whole entire thing and pulling it through this insulation is thwm which is suitable for underground burial and conduit and it's really nice wire compared to the old insulations from years and years ago which are just tw which were thicker insulation and not nearly it's not water resistant or oil resistant like this stuff is this is really good insulation and it's been in use for years you can buy this wire at an electrical supply uh place which is where i bought this which is cheaper than home depot but if you only need a small amount then home depot is certainly more convenient access than or lowe's and maybe an electrical supply house but home depot wanted a dollar a foot for this and i got it for 81 cents at a um a foot that is um at electrical supply place here in the colorado springs area i'll put this one through and then we just have one more wire to go so it'll be per code for a ground wire you can see the size is slightly smaller than the number six it's more apparent if you look at the very end the size the way with electrical wiring the lower the number the larger diameter if you would of the wire itself now a few years ago they started using aluminum in many cases but i don't recommend aluminum because of what's called the expansion contraction coefficient electricity goes through the uh circuit it can heat up the points at which it's attached to such as your points in your electrical main service box or even at your receptacles and has been the cause of fire because of the gap then it develops at that point so always use copper and if you're buying a home you want to check and see what it's wired with because back in the vietnam war era when copper was in short supply they used a lot of aluminum in homes and that's what's caused problems through the years there are ways of mitigating that which are more than what we want to get to in this video but just be aware of problems now you can see this is smaller in diameter than that but still have to pull off i might add when i've had to pull um several even number 12 stranded wires i've had to do this as well if they're going into a junction box where a circuit application where i've had to pull more than two or three okay we're just about ready you see it's kind of sticking up here so what i do is i take my lineman's pliers and scrunch that back in the ways so it doesn't catch and now i'm going to take the whole thing i'll start up here there's some just regular electrical tape kind of do a spiral wrap down usually in the application as you go through the conduit the tape gets kind of torn up and since we're going to have three different poles one through the main house until it goes to what's called an lb which we'll show you when we get outside we'll pull it out there disconnect these uh this uh these wires from the fish tape you want to get down below they're just a little ways what's important otherwise you're going to have a mess to make a nice kind of thing up where it's uh you can grab onto it and then pull it off when you finish okay we're ready for the pull but i want to show you first you kind of want to get it started just by pushing it through now i'll have him go out and pull just a minute but i will be holding it like this as he pulls and we're going to have to stop the video because we need both hands to work during this process but i'll be putting it up like this so i can pull straight in and then pull my wire so he's going to pull only maybe a little over a foot no more than two feet at a time because i've got to pull these wires in and as you can see it's already catching around the corner there so i'm going to have to rig up something here to prevent it from getting stuck under the door so as you can see the wires have now come out and this is what we're using right here so i use my left hand or right hand and then this on top slides forward as it draws in the wire pulling it out as my dad is then feeding it from the other direction like we saw so these are great little machines for electrical pulling again the top portion goes forward as you can see there as i hold the bottom and so with my free hand not my camera phone hand this goes forward and wraps it back up in here as it's pulling it outside all right guys we're underneath the house now we're gonna show you where the wires are pulled from so our box is obviously right up here and we have the nice large conduit here as you can see here makes just pulling a lot easier it's over specked but it just makes pulling a lot easier as you can see here it's bracketed up right here and it's going all the way out that side of the guest house to the lb box now if that's how much wire you need to pull then your job is done but we actually have an lb right here with a waterproof cover and the lb is going underground and then going over to the next pull barn over there as you can see straight ahead right there there's the other lb going into the new garage pull barn where we want our final wire to end up so we actually had to undo the wire here because now we have to go over to that side of the lb push the wire back over here up here connecting the wires once again the same fashion but we've already stripped them so we're saving a step and then we're going to do the same thing again by pulling it down so it's a couple of different steps you can't just go straight from the box down through the lb because we need to have our fish tape puller to be able to come up and pull the wires back down we're going to pull all of what you need for the rest of the run including what has to go up into the box inside the garage out here and then pull in stages pull it all through here and then basically push it through there and then push it up to the box we'll show you that step as we go all right this might really help you out here if you run into a problem with pulling your wire we have a fish tape puller here we inserted over there coming up through here but we hit a snag somewhere down here we weren't sure what's going on so if you run into that problem you just can't get it up we actually then went this direction pushed it down it's come up over here and then we have another fish tape puller we're going to attach to that one to be able to then do our proper procedure so yes you will need two fish tape pullers if you run into that problem we just were fighting something down here it was sticking on and we're working smarter and not harder flexible fish tape here i just happen to have two of them because i was a electrical contractor back in another state but i'm going to attach them together and then use the first fish tape to pull this through and then use this new fish tape to um pull in my wire so that obviously will save you a lot of time instead of trying to fight that whatever that is maybe some glue in the piping we don't know as long as you have two of these you're back in business before you know it all right we've just literally copied everything we did on the first portion for our second pole through the lb connector so let's go ahead and pull it now just about ready for the finish to the pole and as it goes into the final pole i'm going to twist it just a little bit so that we go in straight down here at the bottom this point you can almost push them in and what you want to do is not be too tight enough for the box doesn't have to fight to get on that should be good then you got enough slack here if you have to pull something out for some reason these off because now we can do actually push pushing we won't need the fish tape so i'm going to snip these off we can actually push them through one at a time which makes it easier now you'll notice i've got more wire than what i needed but it's always better to have more wire because you don't want to end up with a short and then i would have to make connections in the lbs which is not recommended and may not be the code so this way i had plenty of wire i'm going to push them through here and then one of us will be out here to kind of guide it in leaving the same amount of slack as before and you can see it's very easy just to go straight through into the other lb push these through one at a time i'm pushing the last one in now and again leave a little bit of slack and that's it we'll put the covers on last and then we'll go inside now okay with this one i'm just going to wrap some tape around the three wire separately just push them up up through this conduit it should be ha ha knock on wood an easy relatively easy push without having to get the fish tape out and do all that stuff again so it won't hopefully catch on anything they're staggered again on this application so try to get your wires somewhat free from kinks so far so good there we go yay now the only problem is we have to keep these straight down here so as i pull up chris will kind of keep them straight let me get your thing down more like this makes it easier to pull on me now we can do one at a time as we get close which i think is we're there let's see i think i'll do the white wire first so i'll pull it separately not jam it in but keep a little bit of slack like always now i'm going to do one of the blacks another black and the last black okay we have pulled in all of our wire all three poles and a good estimation as we can see we do have about you know six feet left over but better to have more than less that's right okay this is the final hookup in the panel that services the subpanel we just pulled the wire in as you can see all four wires coming up here the white neutral goes to the white neutral bus bar the green ground with the tape on it now goes to a separate ground bus bar this is again as a sub panel on this end two if this was the main service and you needed the extra bus bars you would run another ground wire from here to the main grounding bar but we didn't need to do that here actually i did anyway it's right here uh just to make sure those two are connected then um we put in the new 70 amp breaker and uh we'll leave that off but it goes here i'll have to take out two more notches and we'll show you the final installation once all that is done okay we pulled out two more notches on the top here slipped right over obviously put back in your screws and then go ahead and hit your main principle and turn your juice back on which we are hot now and these ones are off currently right now but go ahead and remember to hit those as well and since this is a guest house and i've got the hot electric hot water heater off i've got a weight stein on here with a note here do not turn that breaker on until hot water heater is full of water otherwise you'll burn out the hot water heater which is right here all right guys well thanks so much for watching if you appreciated the video hit that thumbs up and subscribe we got some more electrical check out our other video about sub paneling and we'll wire that one put in a little bit more details with installation of the breakers etc so also check out the channel for that again look in the description box below we'll have a couple of these things linked up take care the party stop guys hit one of these videos continue to watch we'll see you soon [Music] you"

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{

"VideoID": "2696",

"Title": "Bending PVC Conduit for Electrical Wiring",

"URL": "https://www.youtube.com/watch?v=CLFmPc3BB5U",

"Keyword": "Electrical conduit installation",

"Transcript": "welcome back to another electro technology video and in today's video we are going to look at how to bend conduit so let's have a look okay in this video i'm going to show you how to bend a piece of pvc conju the correct way now to do this we actually require a tool and the tool is what we call a conduit spring that's something very simple it looks just like a giant big spring which is really what it is however to use this we need to attach a piece of wire we run the wire through the spring and then attach it to the bottom here and the reason we do this is because when we put the spring in and we do our bending and i'm going to show you how to do that when we need to pull the spring back out again if we didn't pull from this end pulling through there it would stretch out the spring and what happens is this so this spring here you can see it's kind of got a bit of a kink into it and it's been pulled like that and it's still okay but if you did that too much then the spring would be no use to you and you'd have to throw it away and they're rather expensive so you don't want to do that so you put the wire through to the other end hold on to the other end and then pull it that way so how do we actually go about bending the conduit the first thing is we need to measure the point in which we're going to make the bend at so if i had a piece conju like this one i would then take my tape measure mark out my point where i want to bend it and keep in mind anytime you're doing any conduit work if there is writing on the conduit because a lot of times the conjugate will come along with printing on it always try to hide that always try to put on the back sides when it's going to get mounted to the wall that you can't see any writing it's just it makes it look a little bit more professional and a little bit more neat and tidy so i've marked out my spot this is where i want to bend so then i take my spring and with my wire that's at the end i'm going to measure it out and i'm going to put a little kink at the end of the wire or the end of the wire in the middle of the wire i should say so when i put the spring in it'll know where to stop so there is my mark this is the middle of my spring i'll extend out the wire and i'll just put a kink just like that and this is important especially if you're doing you know a bend in a longer piece of conduit you'll definitely need to do that now i can put the spring into the conduit and when i push it through that bend in the wire actually stopped the conduit going sorry to stop the spring from going all the way through but i now know that spring is there nice in between the point i need to bend and to bend it i literally just have to bend it either around my knee or any other particular hard surface that i could use most of the time on the job i'm going to use my knee so i'm going to bring my knee up like that and just bend and there we go now when we are bending our conduit it's really important depending on the bend that you want that you always bend the conduit further than needed at a greater angle so if i needed 90 degrees for example that is what i would actually bend my conjured out you can see that's way more than 90 because when i take the spring out the conduit is going to want to flex back again and try to form its shape so if you bend it just a little bit further than the the angle you're after that will work out well for you so if you're happy with your bend now you just take out the conjugate spring like so and you will see that that is now starting to flex back to a 90 degree bend it may not be 100 perfect but once you then mount it and put your saddles on the wall you can just give it a bit of an adjustment there because it'll still flex a little bit and get a nice neat bend that's all there is to it bending hondu is really really easy the most important thing is getting your measurement correct and putting your bends in the right spot i hope you enjoyed this video and i will see you next time [Music] [Music]"

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{

"VideoID": "2701",

"Title": "Hard Working | installing alot of electrical conduit",

"URL": "https://www.youtube.com/watch?v=II0BkM-stiw",

"Keyword": "Electrical conduit installation",

"Transcript": "all right it's for me and Elven did today last pipe that way drop one down the wall around these conduit there started there what up Alvin nice work and then we ran it all the way down that way and we ain't done"

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{

"VideoID": "2707",

"Title": "How not to install 3” electrical conduit",

"URL": "https://www.youtube.com/watch?v=qcUIdvPw9rU",

"Keyword": "Electrical conduit installation",

"Transcript": "good job electricians look at this how not to install 3-in conduit"

},

{

"VideoID": "2731",

"Title": "Is there a limit to the number of bends in an electrical conduit? #electricalcontractor #electrical",

"URL": "https://www.youtube.com/watch?v=8Ji8fSM\_kEE",

"Keyword": "Electrical conduit installation",

"Transcript": "hey what do you do with the short pieces of electrical conduit after cutting do you throw them away or use them for something else our work philosophy is to save costs as much as possible while still ensuring safety and convenience the short pieces of conduit are used in suitable positions and utilize to the fullest in the project what type of conduit is this and is there a limit to the number of bends in the conduit well this is a type of pvcu conduit for the small projects I work on there's no limit to the number of bends because the conduits aren't too long even over 360° we can still pull the cables through easily if you have any questions about my work feel free to ask thank you for watching the video goodbye and see you next time"

},

{

"VideoID": "2747",

"Title": "ELECTRICAL CONDUIT/How To Run Electrical Conduit For Solar Rooftop",

"URL": "https://www.youtube.com/watch?v=D2-z\_rmcFDY",

"Keyword": "Electrical conduit installation",

"Transcript": "alright folks this is how we did a thing Dave doesn't want disconnect from outside you wanna operate everything inside so right there and all the way this is for his system that's the drip line we make right here when it comes so they can just drip right away cave and crawl all the way inside I know you guys have a lot of ideas out there and this is what you want to do and let him do it yeah they are the panels so I know everybody has an opinion on this and let Dave be Dave okay this is what do you want to do a DIY so I'm here just to watch what he's doing inspect and whatever whatever you had here that's what you want to utilize let's let Dave be one of one of our guys in the community we have a new guy coming up it's gonna be a penis all this solar system he's gonna be explaining to people and this is the way you want to do it and this is gonna do it so right now kgv are super which is divorced the horse he's gonna go there and put some sealant or silicone whatever I call it"

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{

"VideoID": "2789",

"Title": "Students are learning how to run electrical conduit.",

"URL": "https://www.youtube.com/watch?v=W2qp6W32u7g",

"Keyword": "Electrical conduit installation",

"Transcript": "okay that's 16 inches we got the rookie electricians over here you got a measure what I'm gonna go ahead and want some pipe you see the beats hot I mean ten people all right it's a typical time that faulty yes ten feet ten feet one market it was sixteen sixteen got a weapon that's really close it really cost so what do you want to do fine yeah that's a ninety right over that's great to know where we're gonna make the turn 16 we know"

},

{

"VideoID": "2791",

"Title": "Electrical Conduit Pipes Installation | House Wiring | #shorts #youtubeshorts",

"URL": "https://www.youtube.com/watch?v=pLbVPITJQ6U",

"Keyword": "Electrical conduit installation",

"Transcript": "[Music] movies [Music] okay okay"

},

{

"VideoID": "2824",

"Title": "Revit-3D-Electrical Room Tray &amp; Conduit-Part-1",

"URL": "https://www.youtube.com/watch?v=onf3Gx8gi3k",

"Keyword": "Electrical conduit installation",

"Transcript": "friends welcome back to my youtube channel today i am presenting some electrical room coordinations and how to do electrical cable tray conduits and panels so this is for the basic tutorial who are working with mvp drawings like electrical engineering electrical beam modulus so here i place a two panel and two four dbs for example it's from the system tab you can get it from the electrical um electrical equipment so so you can place it easily and you can duplicate also and you can give the width and everything so as like you can give the name like a lv panel okay duplicate it and you can here you can arrange all the other voltage or something like dimensions you can make it so i call it as a lb panel one and this one i i changed to duplicate lv panel 2 okay and i just want to two panels over here i just mirror this one okay so this panel i call as uh duplicate lv parallel three okay the same dimension i'm keeping so you if you need to change the dimensions you can change over here i'm duplicating this one like lv4 will be panel four so four panel i created and some db's also here so if you look the 3d view so it's look like this okay and you can stretch it up to here okay so it is looking like this so i i i am planning to draw some cable trays over here okay i just stretch this section box up to here okay so the room are coming like this and the sections once it's here so first of all i will i will do this one cable tray you can go the system tab then you can get the cable tray from here otherwise you can type your city also like the city is the for the cable tray this is for the conduits this is a parallel conduits and this is are the fittings and these the electrical equipments like dbs and everything you can get it from the here so first in and i i will select one cable tray and i just name given the dimension of cable tray is 900 and i choose then cable tray fittings here lb01 i created like like that you can duplicate learn to give the name also and i given here service name uh like lb01 okay so i just start from here i just passing through this one so this cable trays are created here with the level is 4.6 so how this color is came you you need to go here and you need to create a filter here so you need to create something new just type it lv04 i need to create one cable tray so you are going to here and choose cable tray fittings and here you just give service type equal to lv 04 so this name all all need to same so you need to know which one you are giving the service type name so you can apply and okay and just you need to add that one lv04 okay so you can down this one okay and you can give you some color of this one solid fill and i choosing this cable tray color for yeah i'm using yellow color okay and okay apply okay so once you need the lv4 cable tray with the dimension of 300 and height to maintain that one and i will go here and you need to give the name lb404 so well i will write i will just draw one cable right here so it's uh coming here okay so i've kept it here and i need to create another cable tray create similar or you can go here and i choose this one lv02 and i will service type have given lv02 and the dimension i am giving 600 so i just made one 600 above cable tray 600 mm cable drive this is for lv02 okay so this this color is so we we can go here and we'll see the filter there is a lb02 i given as a green color so i need to draw another cable tray with a 750 mm so the height is same so that name should be 0 3 and here that should be 0 3 so i will just draw one cable tray over here so that is reflected here so if you look the 3d the cable trays are showing here okay so we'll we'll do one thing okay so we can we can give filter options also here like add uh this 0 3 4 okay so we can give them color also in the filter it'll be 2i given green okay so the same you can use it lv3 i a given blue okay solid field okay and there'll be four i given which color something yellow okay okay then sold fill it will it will show here also okay so all the color you can get it in the uh in the 3d view also so i make it two layer for this one i just copy this one okay so otherwise i will just move this one little bit away and i will copy one one layer okay so this uh this one i am planning to give 5 200. a little bit uh okay [Music] so this cable trays are placed here so next step is need to draw some branches and everything okay so what we'll do i'll just remove little bit away from this panel okay this two cable tray i will move uh down to this one gap is like this and this one i will move here okay so like this i change this one to 900 okay line with this one i'll just keep it as it is same same level okay now the six cable trays are created six three layer of cable trays are created so what we'll do we need to draw some branches over here i will delete this one and i'll copy this one to here okay same cable type okay so some branches i need to develop so create similar so i started from here uh this is lv01 i just type lb01 okay and i will make like this and the first cable tray i will do connect to this one so this should be is connected so you can go to the section maybe this level is different that is why it is not picking the connection so 3.50 copy that one and align with this yeah it's maybe the i need to just move it little bit away okay so they need to just connect it yeah it's work like maybe the levels of both are the difference so that is why it's coming like bending radius also different so what i will do i will just undo it and i change this cable try this three cable tray uh size around 450 okay this one also i will change to 450 okay so i will see it's working oh yeah now now you can connect to this one yeah it's below it's taking the this one to below below cable that is why it's coming like this okay so what i will do just delete this one okay and connecting to this one okay we'll go to the 3d view and we'll just stretch it this one down okay so i need to connect with this one yes so it's fixing to it is taking to another one okay so i will just create similar okay this is lv one create similar okay i will just uh draw one cable tray draw cable tray from this point from here to this cable tray okay so it is coming through this one so it is not taken the fitting so what we'll do just stretch it up to here so it is automatically take this branch okay so here this one you can trim it and join the two and the next one is the next cable tray so create similar this is lv01 create similar okay and make one another from here okay so this both are coming here so just need to move the below one below one little bit uh left side okay and this point we can move to align with this uh this one like this okay so the next one uh so we need to connect to the below cable test so you just drop down this one okay then we need to connect this one to here so it is work so the next step is so we need to connect the third cable tray like blue one should be also need to move it to connect to this panel i will just move up to here okay and next is the blue cable tray so that is lv3 i need to create similar so i will give this one lv3 and i have taken one branch from here and i put it here and what i will say three eight nine zero i copy that level copy okay and then then that is the same level of this cable tray so i just made like this okay the cable three cable trays are connected to this panel okay so another this cable tray is the same level so i need to one one cable tray branch to this panel so it will clash with the another cable tray so what we'll do just to split this cable tray sl and split it this one okay and we'll do one thing we'll just drop down this cable tray over here just to move it up to here sorry okay so i will delete this one one and split it sl sl command you can split the cable tray okay so you can delete this thing okay and i just move up to here and i'm giving this one like 3 7 5 0 so if you look they look like this so that this this one is the below of that cable tray yeah see this one this is below the cable tray so what we need to do we need to we need to uh we need to connect this together okay so i will just pick it up to here yeah then i just need to connect like this so it will show like this so there was one bend it will come so it's down and you need we can take the branch from here so we can adjust like this also like a little bit we can adjust it like this so cables are come here and we can draw one cable tray maybe named it a little bit more for the fittings okay so we'll just move up to the here create similar and we will draw one cable right here so this one is lb 2 so this one should be selecting two lb02 and service type is a lv lb 0 2 0 2 okay so that to the same color the cable type will come the cables are come here and it will not clash with this cable tray so you can drop like this okay and if you can move this section mark over here so you can make one bend over here like this so the cables are dropped to this panel okay and one of the things i'll let the above cable tray also same thing so i need to drop drop down to another another level this level so i just deleting this cable tray so this three cable tray and to connect to over here also another side panel so what we'll do and the blue blue cable tray and this one i can take it so i need to take i can i need to take one branch first to another another side so what i will do here is one one bending is there so we can directly take one branch to this panel so i creating similar okay create similar and i connected to here sorry create similar and i took from here to here so there was no clash attack so it will it will directly connecting to this panel so if you go to here so you can uh draw cable tray and drop into this panel okay hopefully you guys understood this video so i will continue on next video so making some conduits and everything so if you like this video please subscribe my channel and like and subscribe it okay if you have any comments please mention my comment box thanks for watching and i will i will give you another video for this conduits running this cable today the same video the part two i will i will make it okay thanks for watching"

},

{

"VideoID": "2837",

"Title": "He designed his own scaffolding using a plank and wooden beams. #construction #eletrician",

"URL": "https://www.youtube.com/watch?v=J-QOW-TaGes",

"Keyword": "Electrical conduit installation",

"Transcript": "do you know what he's doing since this is a staircase and not suitable for setting up scaffolding he designed his own scaffolding using a plank and wooden beams does it look sturdy to you I think even if five people climbed up at once it wouldn't collapse if you were in this position would you have a better solution"

},

{

"VideoID": "2843",

"Title": "Conduit Bending - Making A Quick 90 #electrician #construction",

"URL": "https://www.youtube.com/watch?v=ZAcCUVYMNXw",

"Keyword": "Electrical conduit installation",

"Transcript": "I can't help it that I'm custom made I can't help it that I look good smell good can't dance all night long I can't help it"

},

{

"VideoID": "2849",

"Title": "Electrical Panel Replacement/Install",

"URL": "https://www.youtube.com/watch?v=-nBDlutORiQ",

"Keyword": "Electrical panel installation",

"Transcript": "hey guys sean let's hear from appellation diy and today we're going to be replacing this old electrical panel with a brand new one okay so what we're going to be doing today is replacing this electrical panel and the reason being it has one huge issue with it and that is it doesn't have a main breaker this isn't a sub panel this is a main panel so that means electricity is coming directly from the pole to the meter into the box and what they did is they lugged their hot wires onto the bus bar so there's no way to shut off electricity inside the box and safely work on it you work inside this box you're going to go out electrocuted it's super dangerous it's super stupid the way they have it set up so we need to fix this this is square d's qom style panel box which means it's their commercial grade box so i went to my electrical supply store and i looked for just a main breaker the problem is it was hundred and eighty dollars just for the main breaker so i went to home depot and looked for square d's home line panel and i could pick one up for a hundred and twenty dollars it already comes with a main breaker panel for a 200 amp and it also comes with a couple uh breakers with it so what we're going to do is we're just going to swap out our boxes now i probably wouldn't do this is if this was my home box right if i had tons and tons of wires in here i would have to rip everything out redo that i would probably just spend 180 dollars for just the main breaker since this is in my garage there's only two currently right now breakers that i have in use so it's going to be super easy to just take off our hotlines remove our two services that we have powering the garage and just replace the box so that's why we're going to go this way then i end up with a home line square d box the breakers are going to be cheaper if i want to expand on it i don't have to go and buy the qom style breakers which are probably about double the price the first thing we need to do to actually do this is cut power to the box itself and we're going to head outside to do that so what we're going to do outside is we're going to remove our meter and that basically just jumps the wires coming from the pole into our box pull that off now these are stuck on here really well so just pull down so now with the meter off the top lines are still hot they're coming in from the pole but there's a separation in between there and this meter is what jumps that so now there is no electricity going into our box at all now that we have the meter pulled off from outside we can safely work in the box all right so the first thing that we can do is we can unhook these lines over here on the side so just loosen these screws pull our lines out then go ahead and remove our breakers we can take our neutrals and grounds out of the bar and then we can go ahead and take off our two main lines down to our bus bars and our neutral coming in from the line on top of our box here we have a wire clamp and our knockout we just need to loosen that so we can pull our wires up through our box has four hold downs two up top and then down on the bottom two down right here we're just going to um zip these out just a little bit just so we can get the box off and then slide everything down [Music] so our box is off um what we can do now is we can get our other one set up to put right back on here okay so here is our 200 amp box um a couple quick things about this has our main breaker already installed on it and for these newer style boxes you can see right up here they have these plastic knockouts up here so we can just tap into those it's square d's quick grip thing uh we don't need to take out these knockouts up here if we don't have to or we don't want to so what we're going to do is just utilize these quick grip things uh for mounting we have our uh single mounting hole here to initially get this in place but on the sides here there's one here and one down here we have a flush mount because we're going into a stud bay we don't have to go through here and go through our sheathing into our outside wall make a hole we can just flush mount on the sides we also need to take off our knockout on the bottom here that is where our mains are coming in from the outside so we'll knock that out so we have this knockout one two and then one two on the other side so four knockouts for our flush mount and then we'll just utilize our quick grips on the top uh to run our wire down into the box [Music] so what we need is we need the bottom left knockout out we need the entire thing so we're just going to pop the whole thing out for our three inch knockout okay so there is our three inch knockout hole we can feed our main lines through here and get this box on the wall okay so we are going to feed in our main lines into our box i have a small little screw here that we're going to put through our box and the main hold down that's just going to keep everything on the wall until we get our side flush mounts mounted up okay so that tiny little screw will not go all the way through our sheathing it's just here to hold it on until we get these side mounts in now that we have our box mounted to the wall we can go ahead and take our hot lines and we get them installed onto our main breaker so we're just going to back out these lugs we also have a neutral here in the center and what we're going to do is i have one line that is a little bit longer than the other so we're going to put the longer one over to the right side here the shorter one here to the left side and this is four gauge wire so this stuff is so crazy hard to uh work with but uh it carries your 200 amps so we're going to try and get this bent down in here up a longer panel and up down into this top lug now that we have our line bent to where we want it before we put it into the lug what we're going to do is we're going to put some no locks grease on this end here and basically what that's going to do is it's not going to allow any corrosion to happen between the lug and the wire itself because it creates a whole bunch of stuff that you don't want heat and transfer between here and moving around and all that stuff so go ahead and schmutz this up with some no locks this stuff is kind of like your uh dielectric grease that you use in automotive it's just made for specifically for your panels so once we got that on get our line back where we need it to be put it into our main lug we want our main line coming straight up and down we want it fully seated down into the main breaker so we just want this nice and snugged up nothing crazy then we can go ahead and push this wire back in where it needs to be okay so we have it tucked into the back of our panel this is one of those wires that you don't want to be working around or moving around so as best you can it's number four gauge get it tucked in to the back run it up along the sides and out now we're going to do it to the opposite side now that we have our two main lines hooked up and lugged in and tightened down what we can do is we can go ahead and take our neutral wire and go ahead and put that in the center here once our main lines are all tightened down and everything's good to go we can go ahead and take our lines that we had here and go ahead and put them into our box what's nice about this square d box is it has a quick grip system in it so there are these um v-shaped channels up here on top um just be careful which ones you put them in the smaller ones are made for 14 to 12 to wire the wider ones are obviously your heavier gauges wire so they need to go into their correct slots so they have multiple times on them all we're going to do is we're going to pop this first one out twist it off okay so all you need to do is just get a v crimp on your line and it just slides right back into place um and it's just so nice um it's nice and manageable it's nice and clean you don't got to worry about knockouts um i really actually like this it's pretty nice especially with these new boxes so all we need to do is put a cover over this which is supplied and that just slides right into place so this bar just keeps all of your wires nicely tucked in here there's no way for them to pop out that's the purpose of this bar here so we can just go ahead and feed our wires down through to our breakers so now we're ready to hook up our wiring what we need is breakers i have a 15 amp and a 20 amp breaker so i have two different size wires coming into this box i have a 14 2 which is going to go to our 15 amp and then i have a 12 2 and that's going to go to our 20 amp breaker so for these breakers they're super simple you'll notice that these breakers have a foot on them and also on the back they have a place for the slot that slot goes into your bus bar panel right here the foot clips into this plastic little bar right here so what we're going to do we're going to put our 15 on top doesn't really matter which goes on top the feet clip in and you literally just push the breaker onto the bus bar like that super simple there we go so now we can just feed our wires down into the back here make them nice and neat and then feed into our breakers so the first thing that we're going to do is we're going to bring down our ground we have them twisted together there is no load on the ground wire so they can share the same spot on the neutral bar place that in and then snug that down so there's our ground so now what we can do is we can take our neutral wire and hook that right into our neutral bus bar the only thing is with these neutrals this is a load carrying wire so you can only have one in each slot and it's not like the ground wire so go ahead put that in and snug it up give it a little pull make sure it's in tight so we can take the neutral to our 12 2 wire down here also go ahead and snug that one up as well now what we can do is we can take our hot wire stick it right down in here to this connection right here and then just tighten it down give that a pull okay so we have our connections into our breakers we have our neutrals into our neutral bus bar and we also have our grounds into there alright so now that everything is all buttoned up here we got our box on we got our main lines into our lugs we got our neutral into the center we have all of our wiring hooked back up to our two breakers that we have um the only thing that we did not do is we did not bond or ground our box that's going to be in a separate video if you want to see that go ahead and click up right here but for right now uh this is done um it was pretty simple ripping out the old uh box and putting in this new one i do like the newer features that the home line has like the quick grips it makes it super simple you just kind of slide those into place everything else is pretty much the same i hope you guys enjoyed this video if you did make sure you hit that like button and head over to appellation diy for more videos thanks again guys and i hope to see you next time you"

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"VideoID": "2853",

"Title": "Circuit Breaker and Electrical Panel Basics",

"URL": "https://www.youtube.com/watch?v=bGZVILwbyLo",

"Keyword": "Electrical panel installation",

"Transcript": "so we have a lot of different electrical videos on the channel but today i want to give you the basics of your electrical panel this is one of the parts of your home it's really good to have some basic understanding and that is independent whether or not you want to do any upgrades or if you actually want to work on the panel it's just good knowledge to know so we'll start off from the outside pointing out a few of the features and how to identify some of the basic specifications for your panel then we'll take the cover off looking internally at some of those components and then we'll finish off with a few of the different issues that i've had come up in home inspections so you can take a look and proactively get ahead of that just in case you're wanting to buy or sell a house in the future all right now looking from the outside we have our overall cover in the access door you're probably familiar with this because if you ever had a circuit breaker trip you'd have to open the door and reset your breaker now both on the outside of the door somewhere on the cover itself you probably have the brand of electrical panel which would be the same as the brand of the circuit breakers you're using the four main ones that usually you can get readily available if you ever have to swap out a circuit breaker or do any maintenance is square d this one is a square d and at least in our area is the most common brand then you have ge eaton and siemens those are kind of your four most common but depending on the age depending on your area there could be other brands as well so you have all your different breakers but let's start off with the main breaker here on the bottom is my main breaker and on the switch itself you'll see a small label it either probably has 200 100 or possibly even 60. that is the overall amperage or the amount of current that can go through that breaker before it would trip so this is a 200 amp service which matches my electrical meter installed on the house now mine is on the low side and that is because in this community underground utilities are ran so it comes up from the bottom most of the time you'll actually have lines coming from a transformer on a pole over to a mast on your house and then down so your main is probably up top so then you'll find the labels for your breakers now i think it goes without saying these can be way off so when your electrical surface was first installed hopefully everything was labeled correctly but depending on how much maintenance and who did the work over time these can start to really change so never trust that whatever this says let's say living room and you hit the living room circuit and then you go start to swap out that outlet not so fast you would always want to test that outlet this would hopefully give you the direction of which breaker to hit but it is by no means 100 accurate and to be honest usually there is quite a few errors on these so the only other thing i'll know before we take the cover off and start looking at the internals you'll see that you'll have these smaller circuit breakers which again will be labeled on the switch either 15 or 20 which means 15 amp or 20 amp and again that is going to mean that that circuit has a maximum delivered amperage of either 15 or 20 for a 120 volt circuit then you'll have the thicker breakers that are the thickness of two of these singles that just means that that is going to provide power to a 240 volt circuit that commonly would be a dryer maybe a stove an air conditioning unit and it is going to be the amperage for which is labeled on the switch often 30 40 60 amps depending on what appliance it's actually feeding power to all right now i will remove these bolts usually there is six pan head bolts or screws that you need to remove but just be careful you'll remove either four or five of those and then make sure you have a good hold on the cover before you remove the last one because that cover is going to come right off and you wouldn't want the edge of a cover to go inside the electrical panel because that could create a short and be a very serious situation now i do want to take this time it probably goes without saying the dividing line often between diy and doing electrical in your house and culling in the pros is right here often people do not feel comfortable really going into their electrical panel and that might be a really good guideline for you to follow now if you feel comfortable with your skills it's your own house you've checked your local code and you can do the work for instance i have four open slots here where i could be expanding maybe i want to add something to my garage which is a project that's coming up on the channel so make sure you're working safely and you are comfortable if you're wanting to work inside the electrical panel all right so depending on who did the install for you this might be a rat's nest or might be nicely routed and have a lot of rhyme or reason where things are going and mine might be kind of inverse to what you are looking at i have most my circuits most my romex coming from the top side and i have my main conductors coming from my meter coming from the bottom side so here is the main breaker let's take a closer look i'll show you what's going on all right for right now you can kind of block out all the wires on the side you're just going to focus on the main wires coming from your meter and then that's what's providing all the power through your main 200 amp breaker or whatever amp breaker you have you have a 120 hot coming on the right hand side a 120 hot coming on the left hand side so this one will power the bus bar that goes up through all the circuit breakers on the left hand side and this will provide 120 running the right hand side then you'll have your neutral coming in the middle here and there's actually a bus bar that then will go out to all those screw terminals that you see on the left and right hand side so remember even if you hit the main to off the wires coming in are still hot both on the left and right hand side so just always take caution when you have the cover off your panel so we did have one circuit down here that was added later on so this serves as a good example where you run the romex to your panel you would cut the outside insulation off then you'd have your black hot your white neutral and then your bare copper ground and all those individual wires would then branch to the outside and then go to their independent location the white in this instance runs all the way up to this top breaker here and that is because this is a specific type of breaker called an arc fault where you would have the neutral coming to the breaker for all these other breakers that are not extended back they are not arc fault or they're not gfci so the only wires that you'll see coming to these breakers are just your black hots and then your white neutral wires would be then just ran to these screw terminals so only in the instance of the afci or gfci would you have your neutrals going all the way up to your breakers and also depending on how new your panel is there are some different instances where you don't have to run these independent what are called pigtails connecting down to the screw terminals here so there might be a little bit more elegant insulation if you have a newer panel so one of the most common things a homeowner might do is if you have an issue with a breaker always tripping you might just want to replace this 120 volt square d 20 amp breaker pretty easy all you need to do is you would hit your main power turn that off and then that would turn off power to this entire bus bar you could undo your screw terminal here to get your hot wire off of this breaker and then really all that's going on here is there's a mounting clip in the front and then this clip that actually connects the breaker to the bus bar so even though these both look like they might be connected to power they're not this is just a front mounting clip so once you have the wire off here you can just pull the breaker out and then you'd actually take that down to your home improvement store so you have the example and you can match up the exact breaker because it's not uncommon to have a few different designs even for the same brand if you know you have square d and then what is actually going on inside of these breakers so if you look inside so like i said this is just a mounting clip so that can actually come out and then you have your terminal that the wire would go into which would then go out to your romex that is connected up to this braided copper wire internally and then there's this strip strip here which is actually the main functional piece to the breaker now i'm not going to show you this in action but i will link a video in the description which will show the internals opened up when a short would happen what actually happens internally so you can dive deeper if you'd like but then that braided wire comes over to this contact point but in this state the breaker is open because this contact is not connected up so once it's flipped on so if we turn that on then you can see those contacts are together so as it stands now in the on position you would bring the 120 from the bus bar through this wire internally out the screen terminal and then to your circuit then if a load ever exceeds in this case 20 amps it would heat up this portion and trip the breaker and then that's what would trip your breaker and cut power to that circuit so that is what the internals look like and again if you want to see a full down look down in the description i'll i'll send you over to another video that shows a great example of this actually tripping now when it comes to inspections things that have tripped me up in the past in the past you would have some of these knockouts with romex just coming up through but then you'd have no cable clamp or nothing protecting the romex against the sharp edge of the box so that can be called out in an inspection because it is a dangerous situation that can cut into the insulation of your hot and create a short if your panel is completely full you will want to take off the cover and see if you have one hot wire going to each of your circuits often if it's a full panel you might see two going into each circuit and i know i've been called out in the past as that is not allowed at least within my area and then the last common ones come up in my inspections is these knockouts so if you do not have a breaker in place but someone has popped that knockout out then you have an opening and a safety hazard where somebody could actually put their fingers or something within the panel and cause a short if it is removed and you need to patch the hole you can get filler plates at pretty much any home improvement source so it's not a big deal and actually it's one of the easiest fixes if that comes up in an inspection so hopefully that information gets you a little more comfortable with your electrical panel in your circuit breakers just good information to know as an educated homeowner now if you have any questions or additional comments jump down below the video let me know what you're thinking i always like to get you guys this feedback now if you guys want to continue on your electrical knowledge journey check out this video right here it'll show you some common mistakes seen and even new construction with almost 2 million views on that video it's been a really popular one and we've gotten a lot of good feedback so i appreciate you guys stopping by and we'll catch you on the next video take care"

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"VideoID": "2870",

"Title": "300 amp meter electrical panel installation",

"URL": "https://www.youtube.com/watch?v=DvNcItW344Y",

"Keyword": "Electrical panel installation",

"Transcript": "oh hi everybody so uh yeah we're here uh installing this uh 300 amp uh three meter uh panel box uh we just uh uh yeah we just we just started the labor uh three days ago so uh uh yeah so this is how it looks uh so far yeah we have uh we have installed the three wires uh going uh from the box to the uh to the server service uh mast over there so it's a yeah pretty thick wires uh they are uh [Music] uh the 250 kc meal uh i think they they are uh they are the size of a quarter i think yeah they're really hard to bend so uh yeah so uh yeah right here we have the uh the breakers uh since it's gonna have three meters it's gonna have uh three breakers one for this unit uh one is gonna have it's gonna be for the uh adu that we're just building over here and uh we run uh a two inch uh pipe going there yeah and right here we use the uh the uh we're using the the number two wires yeah with the uh 100 amp uh breaker yeah some people in some uh places they use number four uh right here you see number f two just in case they do wanna change it for uh uh 125 amp um yeah so yeah but this is uh yeah this is how it looks uh how it's looking right now so uh we have the uh the cable uh puller over here and the wires market uh for the uh service company so they can come and uh install it yeah i'm i'm i'm also gonna check if we need like up pulley something uh to hold it um because it's like a 45 i think from the roof to the top so uh yeah i'm gonna double check on that one and see if it's needed yeah but this is how it looks at 300 amps 300 arms in pano yeah so it's uh basically it's pretty much the same than the regular uh small boxes yeah um right here we we uh we need to run the i mean i need we i need to bring the uh ground uh out i already have it uh under the house so i just need to go under the house and uh bring it out yeah sorry it's gonna be uh it's it's gonna be connected uh here from this little one and the little uh thing and right here is gonna be the neutrals yeah so right here uh on on this uh on this uh since this is the the main panel all the uh they they they connect on the same uh uh on the same uh they go to the same the same uh neutral uh wire then the same neutral uh boss bar uh i mean because yeah since uh one of them is uh uh bolted to the body of the uh box the other one uh the neutral uh is the neutral voice that they're gonna go to the uh neutral bus over here so that's that's how it goes yeah on the other side we have the uh the uh the crown bars let me show you over here okay yeah so right here we do have the uh the ground wire we have connected is coming out from uh under the house and we have the clam uh i think this is called acor clam that's uh that's where uh where it goes first and then if it goes here to the uh to the uh to this ground bar this ground bar is uh a feet alone this is five eight and it and we also run another uh we also dig another uh bar over here is uh uh another five eighths and the wire for that gauge is a 4 gauge 4 gauge bear copper okay and yeah so this is how it looks uh i'm gonna cover i'm gonna put some dirt right now okay yeah so on the other side it's gonna uh well it's looking like this we uh run the uh the theater to this box so we have the wires here hanging over here tube it's already dark it's it's not even uh it's like it's not even five and it's very it's kind of dark yeah so uh yeah so this is how it looks right now we have a 100 amp breaker and we just need to buy the uh ground grounding bar uh separate uh evening with this box yeah so on this uh over here in this unit we have uh we already started uh putting the uh boxes so yeah it's pretty much ready to start running the wires we have all these boxes for receptacles this one for uh switch and this one on top for the uh called the smoke detector same thing over here yeah uh [Music] safety called receptacles every 12 feet uh i mean it's uh that's the code but yeah right here is less than 12 feet uh what i like about it is uh um i like to put those receptacles on on those corners so if they want to put the bed somewhere here yeah they can easily do it or even here yeah they can uh they can uh do it without covering the uh without covering the the plaques yeah right here we have a uh this is the the walking closet and we're gonna have a uh uh yeah a light can light and that's gonna be the switch and we're also adding a a swish i mean a receptacle on the bottom just in case that they want to maybe put a iron board or they want to put any uh hidden appliance or whatever they want to do yeah so right here we have the uh the uh laundry we have the box for the 220 uh plug and uh this is going to be the entrance we have the light going outside one switch for the outside and one for inside plugs plugs and lighting lighting we have uh right there on the top we do have a ah what is it called uh a box for a camera and right here is where the kitchen is going to be in this this area in this area over here so uh uh i still need to put a few more boxes here so it's gonna be right here is gonna be the the plug for the disposal in the dishwasher right here we're gonna have a 220 platform wrench a plug another plug and a plug for the refrigerator yeah so this is how it looks uh so far right now the bathrooms well it's gonna be up ah a fan uh maybe a couple of lights and i think that's pretty much it yeah i said it's a tiny bathroom yeah so this is how you look so far yeah if you uh have any questions just please comment and yeah i consider subscribe to my channel i have uh other videos uh the app that previously uh uploaded and um yes uh uh from when we started this idu is this edition uh yeah you wanna uh do yours and you wanna uh do you have some questions yeah yes let me know uh [Music] just let me know uh yeah so uh yeah please consider subscribing as i told you and uh yeah anything just let me know okay thank you have a good day bye"

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"VideoID": "2872",

"Title": "Industrial electrical panel wiring training with all details",

"URL": "https://www.youtube.com/watch?v=Jq8ymMmRSsU",

"Keyword": "Electrical panel installation",

"Transcript": "Hello friends welcome to this training video in this video we are going to wire a three-phase industrial electrical panel if you are interested in electricity I suggest that you watch this video Until the End and pay attention to some points in the first step we install the docks in the electrical panel this electrical panel includes three three-phase output and one single phas output at this stage we install the rails in place the electrical panel equipment is placed on these rails the installation of rails and Ducks is finished in the next part we will install the protective equipment in the electrical panel in this electrical panel we used an rccb switch as the main switch this switch protect people and animals from electrocution this switch supplies electricity to the entire electrical panel the second device is a three-phase monitoring relay this relay is designed to protect three-phase consumers and prevent damage to electric motor by controlling three-phase electricity this electrical panel includes three three-phase outputs for each of which we install a three-phase miniator switch Al this electrical panel includes its singlephase output that is installed on the body of the electrical panel with a single phase phase outlet we use a single phase 2 ampere switch to connect and disconnect the command circuit also each three-phase output needs a contactor which we install we use a current controller relay to prevent each three-phase electric motor in this step we install the input and output terminals on the rails at first we install the three-phase and neutral input terminals three phase and neutral electricity enters the electrical panel using these terminals we use three terminals for each three-phase output and we also install two terminals next to each three-phase output when we intend to use a singlephase output this is for first output this is for second output and this is for third output the installation of the equipment is finished in the next step we will do the wiring of the electrical panel if you don't know the detailed method of wiring the equipment click on the about link and watch the related training video in this step we do the wiring of the power circuit for this we connect three phases and neutral wire from the input terminals to the input of the rccb switch the wiring diagram of this electrical panel will be shown to you at the end of the video that in this step we connect three phases from the output of the rccb switch to the input of the miniature switch this is for the first phase this this is for the second phase and this is for the set phase in this step we connect the wires to the rccb switch before connecting we need to connect three-phase WI s and one neutral wire to the phase controller relay so that they can be controlled using those phases this step we connect the three phases from the output of the miniator switch to the input of the corresponding contactor then we connect the three-phase wires from the output of the contactors and pass through the current controller holes and connect to the output terminals with this the current is measured by these devices for at this stage we have also connected a phase wire from the output of the contact to the single phase output terminals we know that singlephase outputs need a neutral wire so we connect the neutral wire from the output of the rccb switch to the neutral terminals for the singlephase outlet that is connected to the body of the electrical panel also needs a neutral and phase wire so we connect a phase wire from this miniator switch and connect its neutral wire to this rccb switch Al all current controllers contactors and phase controllers need a neutral wire that we connect sh for then we connect the output of the load control relay to the contactor coil with this when the relay is activated the contactor connected and pass the current and if an error accurates it cuts the contactor for to turn on the electric motors we use three selector switch on the door of the electrical panel the input power of this switch is connected to the output of the phas controller relay and their output is connected to the input part of the current controller relay complete the command circuit we connect a phase wire from the output of this switch to the input of the phase controller relay and we connect its output to the input of selector switch the electrical panel wiring is finished at this stage we close the door of the ducts and then show the wiring diagram the wiring diagram of this elect call panel can be seen in this image to learn more please save the image this video is finished if you like the video please press the like And subscribe button goodbye"

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"VideoID": "2881",

"Title": "Electrical Panel Upgrade: LIVE Power Disconnection!",

"URL": "https://www.youtube.com/watch?v=l9EV6xbGej4",

"Keyword": "Electrical panel installation",

"Transcript": "when you're disconnecting power for an \nelectrical panel upgrade you want to   make sure that you cut your hot conductors \nfirst and then disconnect your neutral you   want to take your dikes very carefully on the \nhot conductor and cut it while you're holding   the conductor so it doesn't touch anything else \nthen you cut and then immediately you tape it off get a lot of tape on there so you make sure you're safe leave a tail so you can unwrap it \nlater then you do your second one making   sure to move these other wires out of \nthe way hold the wire tightly and cut   the second one tape it off immediately \ndon't leave the wires just hanging at all put a lot of tape on there just like that \nand then you can cut your third one just like that and we're done"

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"VideoID": "2883",

"Title": "Cargo Trailer Conversion Electrical Installation!",

"URL": "https://www.youtube.com/watch?v=00mOHUv3K-s",

"Keyword": "Electrical panel installation",

"Transcript": "[Music] what's up everyone wilde Schneider outdoors sorry if it's dark in here but today we are putting in our electrical system this includes wiring up this cabinet so that way we have our breakers our batteries this charge controller I'll like the shunt everything is going to be wired up in there we're gonna run all the cables that we need for the trailer for the future build so we got our ports on the side wires run for the lights that we're gonna eventually have in here and then the fan all that stuff get all that put in get the panel mounted on the roof get the wires plumbed down through get that all sealed up just in case it rains which is kind of cloudy so it might yeah exciting day getting this cabinet finally installed completely up against the wall screwed down secured so that we don't have to worry about it going anywhere and of course you guys are coming along for the ride to see how this goes so next video in the trailer build series here we go alright update we've got the solar panel connections right here plumbed in we're gonna get this all sealed up and secured down we've got the holes pre-drilled for the solar panel I made a boo-boo accidentally drilled an extra hole that's okay we'll fix it later glowing it the solar panel mallets that way it's up here and good to go get the wires run get everything run down inside so we can start building out the cabinet then the roof is done don't need to mess with it so that's where we are alright now I gotta get the butyl tape put it up on where all the screws are gonna be coming in and that way we get a double seal when we put the lap sealant over the top of that [Music] whole job will get everything plugged up nice tight connection here those are waterproof themselves flip the panel over get them tucked in [Music] [Music] [Music] sweet got the lap sealant on not beautiful lots of extra but not a big deal the more lap sealant the better alright coming back in here electrical today so in here we've got the charge controller mounted the batteries in place we've got the breaker the shut is all wired in right in there then we've got the breaker coming off of the solar panel and then the DC fuse box okay gonna get all these wires that are in here all out into the DC fuse box find a place to get the battery monitor mounted and yeah should be good [Music] [Music] [Music] okay super messy but we've got alright so it has been one whole day since I read or since I recorded that sped up footage of me wiring the fuse box and I gotta tell you my OCD kicked in and I just couldn't take anymore so also we added this which is not completely wired in yet I have to get it sealed up and let this dry because it got wet so don't let that happen but that'll be done so this will all be wired and we'll be good to go gotta show you what we've done in here so cleaned everything up this is our Shore power so that plug you just saw runs in through the floor everything siliconed and good to go back in here the breakers are all wired up this is a 30 amp service so we can plug in now we don't have a battery converter yet not going to worry about that for now as we have the solar panel up top but this will reflect into Shore power if we need to we can run the air conditioner we can also run our refrigerator we have one plug that we installed on the side of this cabinet sorry wires are everywhere but one plug here so if we have to we can turn that on when we're plugged into Shore power and then of course our refrigerator so that's there also safety switch for the solar system it is not safe to work with solar wiring when the solar panels on the roof so you have to have a way to we added that cleaned up the wires have everything running so it's out of the way removed the fuse from the charge controller to the battery because it was in the way it was wrapped around the shunt no good we move moved this breaker as well and then just cleaned up all the wiring for these got everything secured in there so that's that's done still haven't mounted this yet but great little controller here so yeah here it is all complete just figured we'd wait to publish the electrical video until I cleaned this up so now it is clean we've got the vent run and sealed in for the battery everything is good to go so that is it for the electrical for the most part place is a mess you get going in project mode and everything just gets dirty but now it's done have a couple of beds back here the wife and I uh there was a thunderstorm last night and well metal roof so we wanted to come out and lay and listen to the rain listen to a thunderstorm while being in our trailer so we had some blowup beds laid down but anyways thank you so much for sticking with us today the trailer build is coming along nicely and I can't wait to get everything else going now that the electrical is done we're gonna really start working on this hard core so everything's coming in the mail as soon as it gets here we're gonna start working on it and just keep posting videos I want to get this trailer done as soon as possible so thank you so much leave a like leave a comment if you feel like doing so subscribe as videos are gonna keep coming out and of course as always stay well [Music] [Music]"

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"VideoID": "2885",

"Title": "DIY campervan electrical installation (Ecoflow Powerkit)",

"URL": "https://www.youtube.com/watch?v=s5d826UHNw8",

"Keyword": "Electrical panel installation",

"Transcript": "hey guys it's Brandon with someday Vans and we just got this new product in that we're very excited about um it's a new product from ecoflow called their their power kits and this particular kit is um the four kilowatt hour kit so it comes with two two kilowatt batteries and they also have an option of five kilowatt battery so you can choose whether you do two kilowatt or five kilowatt batteries and you can stock up to three of them in a system so if you want five kilowatt you could go to 15 maximum if you do the two kilowatt hours you can go up to six but you have to use the same type of battery you can't mix and match two different types of batteries so these are two batteries this is their main power hub kit and we'll go through it in a minute but it's got all the ports on the bottom everything is built into this so this is the 3600 watt inverter and it's got a charge controller in it has alternator charging capacity in it and it also basically like does all that in one unit without having to have fuses and wires and different devices that are communicating together essentially so next which what I'm most excited about on this unit is this right here which is their distribution panel so this is an AC and a DC distribution panel built into one most products out there are one or the other and this is all pre-wired and ready to go it's got um 12 DC circuits available and three AC circuits available and and it all gets wired right in pretty easily um and another cool thing about this is these first six fuses are controllable so they're remote controlled either through the app that if you're blue if you're connected to Bluetooth you can do that through the app or you can connect those through their controller I forget what they call it here I don't know this screen the um I don't know I'll look it up and I'll figure it out but this is their screen and essentially this all communicates directly through the main Hub right here so you've got ethernet cable plugs in from here plugs into the main unit you've got another ethernet cable that plugs from this dcg distribution into the main unit or AC and DC distribution and everything there's literally like almost no you're not stripping wires putting you know heat shrink on changing you know having all these different components and everything in here comes in the kit so when you look at the pricing of the kit it it's definitely more expensive than something you could get on Amazon and or even like summer the lower end good products like renegie um or like a Goal Zero system where but you're getting all the cabling all the connections you're not having to buy fuses anything like that so you know when you size it up to a similar system like especially like we typically do victron systems and aren't really high-end builds this is much cheaper than victron and the labor there's like almost you know it's much easier to put together you have a lot less hours in building the system um and everything is just really integrated into one unit which I I'm really excited about this is our first by the way this is our first system that we've gotten um and this is the first van we're putting it in so we're we're hoping if this system is everything that it seems like it will be that these are probably the systems we'll be using in most all of our bands moving forward um it seems to kind of hit all the boxes it's it's cheaper than victron but it's more expensive than say a simple system but it does seem to have the capability to expand that has a big enough inverter that you can run you know a small AC unit on it um that's one of kind of some of the other products out there that go zero we have used on some of the smaller builds which they're great but they don't provide you know you're still building a lot of the other parts then integrating it they also only have a 2000 watt inverter which which is fine for most applications but it's nice to have something a little more capable so um all the cabling is all right here so these cables are very simple this is their battery cable so you literally pop the top off plug the battery in you plug the cable into you know battery slot one there's battery slot two and there's battery slot three or you can use their generator into slot three but it's it's there's there's no wiring there's no fusing it's just a very very so they've also got a cable here um for our inputs on this so we have solar cable which already comes with mc4 connectors that plugs in um down here which one it is pvn1 or two they've actually got two different solar inputs um we've got our AC in so this would wire to your Shore power so this is one of the few wires that you'd have to do is you'd have to connect these into your whatever Shore power port you have on the side of your van and it plugs into the unit and then we have our alternator charging plug which um already comes pre-wired with terminals on it that could go to your battery excuse me that would go to your van battery or your alternator however you're going to hook into your your drive system so it plugs right into the plugs right into the unit and there's like basically no wiring again you know this is six gauge wire and for the amount of length here you know this is a hundred dollars worth of wire right here each one of these wire connections when you add up a system that you build yourself as far as cost comparison you're probably not far behind this and if you're doing a victron system you're you're way way above it so um it's just all integrated into one which is really really nice so we are going to install this system in this new van we've got we've actually been waiting we've pretty much finished we're really close to finishing the van a couple of days ago and we've been waiting on this system to get here so it's all pre-wired and we are going to put this system in and then we just have to finish the bed in an upper cabinet and this van will be probably for rent this summer we'll see but um we're very excited to try this new kit out and see how it goes in so we're going to kind of bring you along with us while we're installing it and discovering it this is the first kit we put in so we're still kind of learning through it but we're gonna start figuring out how to mount some of this stuff in there and kind of walk you through the process of plugging it in and making sure it all works and and getting a coin so hopefully it'll be helpful if you're looking at getting an electrical kit into your van so we got the kit in the van here and we're trying to figure out where everything is going to be mounted um this is the main unit so we're kind of focusing on this first and we're going to go ahead and mount this unit right in this area so in order to mount it they've got a pretty easy mounting system they got this bracket that you mount on the wall and then you slide uh this unit you slide the unit down onto it got two more brackets three holes on the top three holes on the bottom to get screwed in and then those get also screwed onto the wall so we're going to start by mounting that unit right here um and then what we're going to do we've got all of our wires like roughed out of the van in this corner right here so this is where our distribution panel is going to go so we'll cut out a box here we're going to set this unit I think somewhere right in this area we have our ethernet cable that's going to go up to the screen in the front we've already run it in the wall so you want to run this this specific cable probably should be run before you you know close up your wall paneling and everything and it's run into the top corner where our screen is going to be this will get plugged into our unit we'll also have the other ethernet cable because from this unit to our distribution box um that controls those six on and off switches and kind of tells you what's going on from each circuit so we're going to get started and mounting obviously the batteries are going to mount here but we're kind of not worried about those those are going to be last because the cabling and everything is outside we're going to start with this we're gonna do our DC distribution panel and um and see where that gets us all right so we've kind of prepped um the area that's going to go here we've got our main Mount right here that the power unit is going to set on and then it also gets screwed from the top and bottom um I've got a hole cut open for our distribution panel our AC distribution box and then we've also got a hole here that a lot of our wires are going to go through like our main wires that you're going to go through from behind this kit if you want to get really fancy when you when you put it up you can drill holes directly behind each wire and go straight into the wall it's a really clean look we couldn't really do it here because we're we're pretty low we're getting close to the wheel well there and we've got it metal behind there so we're just going through one hole and we'll hopefully be able to tuck everything in behind so as far as running the wires um obviously it's like any other off-grid system but it's fairly it's really pretty straightforward I just I started running wires and I wanted to finish on camera so we've got three inputs into any any system in a van like this we've got our solar input which is right here this is the ecoflow cable I've got it running through the hole and it's going up and connected to the solar panels this comes with the mc4 clips on it already so depending on how you wire your solar you could plug it right in and it's labeled pvm and we plug it right into pvn on the system right here our second input on a van would be your AC end so that's your Shore power plug basically and so on the back corner of this van we've got a little 30 amp Shore power plug and um this cable right here is running to that plug so this is the AC import and on the ecoflow power kit you've got your AC in it says 100 to 120 volt you go ahead and plug that in and that's our two inputs and the third input on the van will be the alternator charging and so let me look through here I have not put this one in yet but where are we at they're all labeled to what they are so this is alt in this is alternator charging in since we started this van before we got the kit um we haven't run an alternator line yet so we're actually going to drill through the floor and under the van and then up to a battery or the alternator on this ProMaster so we're going to wait to put this Cable in but this would go right in this first spot next to the solar plugs in right there and that's it so those are your three inputs onto the system all you have to do is plug them in run them to where they go everything's labeled everything's super simple and easy and these plugs are really nice they've got a little button on the top that you have to push in order to pull them out they're really pretty high quality pretty nice stuff um been really impressed with all the quality of the the products here so that's all the inputs on ecoflow as far as the outputs go from the power unit we're going out from this unit to our distribution panel so we've got a couple cables this is our DC out plug-in right here it'll go through this hole in the wall and we're going to bring it out this hole here and that will get connected into our distribution panel on the right side which is the DC side you've got DC on this side you've got AC on this side and with um you've got a hole coming in on both sides from either the back of the unit or the side of the unit which we'll do in a little bit but I'm going to go ahead and run this wire okay so this is the DC out it'll get plugged in right there and the next output on this is your AC which is also going to go to the distribution panel and you can buy these kits without the distribution panel you can buy them without the main monitor honestly I it seems to me I mean we haven't used it yet this is our first one but it seems to me that the distribution panel is like a huge huge plus to this product I can see not using the controller because everything you can do on that you can pretty much do on your phone through the app but I just don't like to always have to get my phone out if I want to glance over at you know what what the unit is doing and we're thinking if we rent this unit out um if we rent this van out the renters will all have to like get an app and figure out how to use it and whatnot we'll just have a panel in there so this is the AC you'll see it's got standard you know ground neutral and hot cables on it and this is going to do the same thing we're going to run it through this hole and this gets plugged in over here like that it's very pretty pretty clean plug-in setup and that again will plug into the distribution panel and and it'll be on the left side which is which is all the AC load signs the only wire left we have to put in as far as this goes is our communication cable so you'll see we've got one cable already run through here and this goes through that hole and it comes out up at the top of the van which is where our screen is going to be the other cable is going to go again through this hole but it's going to come out into the distribution panel now if you don't have one of the two either the either the um screen or the AC DC box you ecoflow sends a little uh like a little plug that goes in the port apparently the system doesn't work correctly if you don't have one of those plugged in so you either have to have the ethernet cable plugged in and using the system or if you're not using that they have a provided um little piece that you can put plug in to kind of bypass those okay so both of these and it doesn't matter which order they go in get plugged in on the side here one there one there and then it's communicating effectively with both the control screen in the AC DC distribution panel so that's pretty much all how everything is getting wired I'm gonna basically take all those wires back off I was just kind of trying to figure out get everything laid out and then this looks kind of like a mess right here but it really is fairly simple all these wires are our 12 volt you know these are our circuits for 12 volt and for 110 volt in the Ace in the band and then the only other plugs that come in with the ecoflow kit are the battery plugs which those aren't going through the wall they're a little bit shorter and they get plugged in down here and they'll get plugged into the top of the batteries once those get mounted but that should all be kind of hidden back in the corner so we're not going to run any of that through the wall I just wanted to get this stuff running so we're going to go ahead and try to get this panel mounted and get our power unit mounted up and get these wires in and and see where it gets us they do have a template that you can use which is pretty nice and it also shows what the clearance above and below for airflow is supposed to be for installation to make sure it stays cool so we went ahead and mounted the bracket already and then it's got a Brack two brackets one on the top one on the bottom they both get screwed in which we've already installed on this Eco flow kit let me line it up takes a second but if you get it lined up right you should drop into place on that um on the main bracket on the back and then I went ahead and pre-drilled holes again everything's included in this kit they have the screws for mounting it right here and we put this in a spot where we'll have a metal on the back side of the van to actually screw into so this is a pretty heavy unit I don't know what it weighs Maybe 40 pounds or something so you want to make sure really well um you wouldn't want this thing going anywhere you got the unit mounted and now we've got all the cables that we ran before coming out the hole here they all get plugged in in their respective ports we can kind of Tuck everything in behind here and and you know make it look all nice and neat all those cables are basically the ones that are coming through this hole some of them are out here and they'll all get run into this distribution panel now these panels can get mounted two ways you can mount them straight on the on the wood like that it's fine but in my opinion kind of ugly because it is such a nice Sleek panel and uh it's got that really cool little cover on it it's semi-transparent but a lot of places especially on Vans this is this um back is a little too thick so what we did is we went ahead and fabriced up a little ring just took half inch plywood and fabriced it we're going to put that ring behind this and then we'll put the panel in so what that does is it brings the Box off the wall in this case a half an inch you could go a little more or less you could use quarter inch three quarter multiple layers of plywood but because we would hit the outside of the van here if we didn't add this so we added this when we set that in there we'll bring all the um wires through here through these two holes or through the side holes probably just because we won't have enough room on the back it'll be touching the wall and then now get screwed right to the panel and it'll be a flush mount even though we'll have this fabric maybe not quite as good of a look but much better than just mounting it right on the wall so we're gonna go ahead and start wiring this up pulling these wires through and getting these and then we'll catch back up with you when we get ready to wire this fuse panel foreign so we've got the main power unit installed it's mounted onto the wall um and we've got all the cables plugged in that need plugged in both of our ethernet cables over here are AC and DC out that are going to the panel as well as our ACN from Shore power and our Solar in right here the only one we haven't done is the alternator in which is going to go through the floor somewhere not exactly sure where yet so um now we're going to move on over here to the AC DC distribution panel and this is a super easy panel to wire I'm really liking how this thing is laid out um basically this panel has an AC side and a DC side so we've got our two cables coming from the power unit over here and our AC cable is right here and it's coming up through the bottom and this panel it's all pre-wired this is all these terminals are already on here and they get they're going to get screwed into these right here and then the same on the DC side we've got our DC cable coming from the power unit it's going to get screwed onto these main lugs right here terminals are provided pre-cramped screws are provided everything is right there super easy to install the only other cable coming from this unit is your ethernet line that gets plugged in right up here and that communicates with the power hub and the main screen to turn these first six controls on right here so we're going to start wiring this up by and installing these two the AC and the DC and then um we've got our our lines already separated out so these are ac lines they're 110 um lines there's an outlet here a circuit for an out two outlets I think and the air conditioner and then this side is all 12 volt lines DC lines and if you want to be able to switch those lines on just make sure that you're using the first six even though there's 12 here there's a remote controlled only for the first six but in this van we're going to be using them for pretty much all the switches in this van I think actually all the switches in this fan so as far as lighting water water pump there's um under cabinet lighting that'll be on the switch the furnace we like to put on switches in case you need to reset them so and then you can change out your fuses based on the gauge of wire that you have or the appliance that's on that on that particular run so we're going to start wiring this up and we'll catch back up with you when we've got it complete [Laughter] foreign [Applause] [Laughter] so we've got all the AC and DC lines connected you'll see these nice little lever connectors that you just pull up on push the wire in push down they're super convenient there's different Knockouts around the box so you can bring the wires in at different different angles but for us we brought them all in on the bottom so that we could Rock the box into the wall this thing's pretty much finished the only really thing to note on here is that you want to make sure that like once you have everything wired that your fuses and your and your Breakers are at the same amperage so we've got the first two Breakers here are 30 amp Breakers so we've got our air conditioning on the first one but then the other lines would be 20 amp and in this van we only have one other line so it's on the number three and then these fuses can all be swapped out with whatever fuses um you you want for that circuit so ecoflow actually provides an array of different fuses they've got 10 15 20 amp 30 amp fuses um I think 30 amp is the max that you can pull on any of these so um once we have all of this finished up we'll go through and and change those fuses based on what Appliance it needs so once you have it all done you grab the panel cover makes a really nice cover over over that and there's six little screws that get put in so I'm gonna go ahead and put those in [Music] and now you can take the cover that goes over the panel oh my God and put it right over the top so the last step here is installing batteries and uh it's again pretty simple process they've made everything really easy there is a battery mounting kit which with each battery there's a couple different ways you can mount the batteries ours are going this direction and then we're gonna stack two on top of each other so you've got brackets for the for the short sides that I'm going like this brackets for the long sides go on the battery like this they get screwed to the floor we'll have we've got little straps that go through these holes and then go up and around the battery now the battery is kind of fit in together with each other so if you look on the battery here on the back of the battery this is our battery cable they're fairly short battery cable so you want to make sure that you're mounting your batteries pretty close to the inverter um but you've got a battery cable for each one it goes in the top here and then this the battery cable will get plugged into our battery spot if you're going to stack batteries you want to make sure that the cable is plugged into the bottom one first and then top one will go on top of it and they actually kind of fit together in a little bit of a Groove so they're kind of made to stack on top of each other like that and then what we're going to do is take these cables we'll run them around probably around the back side of the batteries and you plug them in to these three spots so you've got uh we're going to plug into the first two spots again pretty simple they go like that and click in this one will get plugged in there again we'll kind of you know make sure all the cables are tidied and then once we get all this mounted the only thing left to look at is our ethernet cable up here that we just connected to the main screens [Music] so as you can see we finished everything up we got the batteries mounted and tidied all the wiring up we went ahead and put our bed in and our upper cabinet that we were waiting on for this build this Van's actually like basically done now um I'm gonna go ahead and show you the screen up front and kind of the functionality and and and then maybe a few pros and cons on this system as far as install in the back there's really no other product on the market that gives you this sort of install speed and um in this sort of Plug and Play functionality in in an electrical system it also looks great so I don't feel like we need to encase it in a box that restricts air movement that adds weight to the van you know you could put it in a box um in like an electrical box but in a lot of builds there's probably not really a need to and um in our case we're trying to start getting into builds that are at a lower price point for more people to enjoy van life and to get out there than probably be renting more so we're looking at ways to um kind of simplify our builds but still offer a great value and great quality in our builds and I think this is a really a product that can can hit that really mid-range user so there are some limitations um as far as you know how fast you can charge through the alternator and and the DC output for example it's not going to run a nomadic cooling air conditioner because the your DC output's too low so there's there's a few Maybe a few limitations on it that maybe someone would say I want to go with a victron system um instead because of X Y and Z but for the thousands of dollars of savings in material cost but also for us more in labor costs if you're going to have it built out professionally um labor is is one of the most expensive things in the build so the more products that we can use that um that speed up the build process the cheaper we're able to build a van for and that's good for everyone so let me take you up to the controller and we'll kind of go through the interface and see how the the whole system works and then we'll go through a few pros and cons on this kit and uh and that's about it I'll show you is use to monitor on your battery system and control your output and inputs on it and in this van we've got it mounted right here um it typically mounts on a flat surface but we went ahead and just got a sheet Mount and screwed it through the back of the the screen right here and screwed it to the wall which allowed us to kind of Mount it in the corner here because it was a little bit of an on mounting location um but otherwise all it is is the actual ethernet port that you plug in here it Powers it it sends the all the data back and forth so there's no other power requirements or other kind of wires that have to be plugged in to run this so I'm going to go ahead and go through the functionality of this this is your main screen right here you essentially have three places you can go from this screen you can go to the main system right here it shows you your full your battery percentage it also gives you information on each battery that's plugged in so here we have a two kilowatt battery and a two kilowatt battery your third one would pop up here if you had that and you also have voltage and amperage coming into or out of each battery right here and if there's a if one battery has an issue or something like that it'll pop up here and show you that individually you can see what's going on in each battery so that's kind of the just general battery screen right here and then from here you've got your input side and your output side of the system so if we go into the input side like we said we have three inputs coming in here so one is the alternator that shows right here shows your voltage your amperage coming in everything like that your second one is solar which we have plugged in looks like we've got 182 Watts coming in on solar your third one is your extra solar Port that if you have um external solar panels or anything like that you could wire up to this port and your fourth one is your AC so we're not using that extra solar on this particular build we just have these three so that's that fourth one is your AC which is your Shore power so it's showing you how much input you have coming in on each circuit individually and then if you want to edit things you can do so right here you can turn on and off idle vehicle charging meaning that if you don't want your vehicle to charge while you're idle some older Vans you may not want to have the alternator may not really be able to keep up or may not be rated for that much current so you can turn that off um you have AC input current which is nice if you're at someone's house and you're on like a say a regular house breaker you can maybe turn that down to 15 amp and then your system is not going to keep tripping the breaker at their house or at a campground if they're if it's a campsite that doesn't have a 30 amp hookup it maybe only have a 15 or a 20 amp hookup you can turn it down there and then you also have alternator current input so again if you're on an older vehicle maybe you only want to have 30 amp input or you if you have issues with your main starter battery you can program this to not be charging as quickly from the alternator um that's pretty much the input side and the output side is right here so the output side is switched into two different categories you have AC which you can click right here on the blue it'll show up a little blue line to show that you're on the AC side or you can you can be on the DC side so on the AC side of course you've got a button that will turn the entire AC side on and off essentially the inverter and then you have each individual circuit so we have our air conditioner on this one and we have an outlet on this one right here both of them are pulling zero Watts right now but if they were pulling it you could tell how much they were we can turn that off and that essentially turns our inverter off if we switch to the DC side this is where you have your six controllable switches so our main lights are on a switch you click right there under cabinet lights on a switch we turn those off we can turn them back on and you can show see how much each circuit is pulling you've got our water pump oops right here which didn't kick on yet because the water is under pressure we have our refrigerator furnace this one's not unused and then we've got fan USB reading lights I think that's it on this one so you can switch them on and off right here I think the biggest disadvantage to this power system the thing that we've found that we dislike the most about it right now is on this screen right here if you don't exactly touch the button the on and off switch where you want it and you touch like the side of it it will come up and allow you to edit it which we find as kind of a problem especially if we're going to be renting the van out we don't want people to accidentally be like changing their circuit um names and whatnot in the app it doesn't do that it has a separate setting where you can go in and edit those on and off so um something to think about is that maybe you know sometimes it's it makes more sense to just mount a tablet and run the App instead of using the actual um the actual screen that they provide and it can be kind of cheaper in some instances um and again we can edit this you can put your DC Outlet voltage if you click this you're allowed to go 12 volt or 24 volt obviously you don't want to turn it to 24 volt if everything you have wired on it is 12 is 12. and then you can turn your GFCI on as well for the breakers so I would say that main disadvantage is that is on this output screen where you can edit things um it's also a little unclear to figure out if you're on DC or AC um once you know how to use it it's not a problem but it is a little bit unclear it would be nice to have maybe two separate screens for AC DC or have them all on the same screen just have more buttons something like that and then the other thing that I guess complaint we could have is it would be nice if we had a screen like this that showed battery percentage and then also had all your your six switches on it by and large though it's a pretty good screen it's the app is definitely a little more intuitive and a little prettier but it's nice to have a standalone screen that's plugged in and you know you don't have to recharge it or worry about Bluetooth connection um like you would if you mounted a tablet in here so overall we've been pretty impressed with the system there's maybe just like a couple of little things that we could critique on it but overall there's really no other system on the market that's going to do what this can and and be able to be installed in a reasonable amount of time um and for and and the main thing especially for diy-ers out there or Builders like us that don't I mean we've done our own electrical but we don't necessarily specialize in it it's nice to not have to stock all the wire and cabling and and then also keep up with all the the new Innovations um in that space and and make sure all the wiring sizes is is sized properly and all those different things that come with electrical so um obviously it's not going to replace a victron system for a couple of those really top end builds but I think for the bulk majority of band Builders out there or diyers out there this could be a really really good solution so we'll keep you updated as we find uh find out more um a kind of How It's Working how we're liking it and if we start doing doing more of these but we are a dealer for ecoflow so if you're interested in getting one of these kits installed in your van um or if you if you want to purchase it and install it yourself you can give us a call or email us and we'd be happy to to help you help you through that process so I think that's it thanks for watching foreign"

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"VideoID": "2888",

"Title": "Solar Panels &amp; Battery Storage - Prosumer Electrical Installation Tech Tour",

"URL": "https://www.youtube.com/watch?v=CRYnracqRjM",

"Keyword": "Electrical panel installation",

"Transcript": "it's a glorious sunny day and i've got our onsite \nwith kieran from K Cahill electrical contractors   at the property i'm at he's already installed \nan in roof six kilowatt solar array as part of a prosumer electrical installation and behind   me is putting together the elements to store that \nenergy he's got the Growatt hybrid inverter as   well as his dc storage his bank of batteries we're \ngoing to take a look and have a chat with kieran   and see what he's up to thank you for allowing us \ncome on talk with you kieran you're pretty busy at   the minute aren't you i'm very busy okay so what's \nthe first thing we're doing here so this all looks   lots of leads and complicated we're just talking \nthrough what you've got we're just prepping for   the hybrids to be mounted on the wall um we've \ngot our battery leads here communication cable   for the battery and our ct cable to measure the \ncurrent of the property um so yeah basically just   getting it all prepped ready to go so we just \nhang on the wall pretty secure and this bit of   kit is he's changing the dc into ac is that what \nit is and then it can also dot you doing charges   for batteries as well so it charges them in dc and \nwe're about 25 meters away from that solar array   and we'll we bringing dc down in those cables just \ntalking through what's happening there yeah we're   gonna be running them through inside the house \ndropping it down so it's in the garage so it's   nice and neatly accessible um so yeah that's why \nwe're gonna run it all through it's a couple of   strings is that right yeah two string systems \nso we're gonna run two strings from the garage   up into the roof and yeah protect them all the \nway and protect them through they come into here   trunk it down here and make a nice job of it \nto make it nice and tidy so i step away for a   few seconds and already kieran's got the grow what \non the wall so at the minute we're just trying to   mount some trunking what's going in the trunking \nuh just all our dc pack for the battery some   communication cables just to dress it so it looks \nnice and tidy so we put all our isolators on   so we can isolate our strings our ac and we can \nput some eps an eps socket below so obviously   there's a matching power supply also so yeah nice \nand straightforward and we'll come into that eps   socket once we get it mounted explain what that \nis i recognize this isolator as a scar me one   we're isolating a couple of things here could \nyou just talk me through what we're saying we're   isolating the ac that goes back to the fuse board \nand where i send the two dc strings from the roof   to the inverter so just to catch up into real time \nhere we're about 40 minutes into the install and   we're already at the point where we're going to \nbe mounting the battery pack here and what is the   kilowatt rating of the battery pack uh we've got \nsix and a half kilowatts per cell so we've got 13   kilowatts in storage in total and could we add \nmore if we wanted to yep we can add more that's   why we put in the garage so they can adapt \nit so we can add more cells at a later date lock it in i almost couldn't keep up with you \nthere so we just dropped onto the bracket and   you're locking it and just showing that locking \nmechanism here which just stops it from falling   forward so solid as a rock and that is it ford \nyep said so we're connecting it to the leads above   here and you're just going to root them through \nthe trunking and then that's it yeah ready to go so second one on the wall lovely ready to rock just dressing the cables into the trunk here \nokay and these are going to connect straight   to the battery yep they click straight in so \nthe trunking for you is cosmetic majority of   cases and just obviously just protection so it \nmaintains the cables are not going to get damaged   or any little kitties are going to get their \nfingers in okay so pop those through there and   then it's just a simple case of connecting to \nthe battery connect the battery yep click it in   oh wow we'll click it in and then we can just lose \nthe remainer in the trunk remaining in the trunk   in just to make it look nice and pretty another \nset over here for the first battery so if we were   going for more than two two cells or two batteries \nwe'd obviously have another set we can adapt   it yeah we can change the leads over so we can \nget different leads so we can adapt for it yeah so we've got a black one and an orange \none just talk me through while i've got   two different colors just positive negative \nthat's all for the batteries and what color   are they using the positive them \npositive is the orange lead okay   so of course we always think of red and \nblack don't we so yeah orange and black I'm just putting in the Can bus cable now to link \nup to the batteries so this is communication so   it's data is it to make it well it's just to \ntransmit a signal so the battery knows what   to do so it's discharging or charging so it's \njust to indicate what it does this little unit   here okay that's got an rj45 end on an rj45 \nend on yeah but it's not as if it's giving it   internet connection no it's not no it's just a \ncommunication so it just lets the battery know   what's going on basically okay so you wiggle that \none through and you've also linked them together   so then they discharge and charge in sequence of \neach other so they all communicating together so   that's it so just show me the linking cable being \nthe one the linking cables this one here obviously   how to put a little port in here just to close the \ncircuit from here into the link in this side here   so we've got a meter here so yeah so the pv will \nbe feeding the meter and the output will be going   back to the fuse board into the property okay \nand this is a requirement we have to have this   don't we yeah for mcs regulations yep so \nyou can get also you can register for the   uh for your export tariff so that means being paid \nto export energy however looking at the batteries   here we're trying to keep that energy because we \nmight be getting five six seven p for exporting   and then buying it back later in the evening \nat 30 pence or something ridiculous correct i'm like literally i'm just plugging the \nac in now and it's as simple as that so   that's the ac album 80 output which goes \nvia a switch in the meter doesn't it yep   so that's in and connected and the other end of \nthat's the one that we're going to see connected   into the scene at some point any other connections \nin here that we're going to concentrate on next   you've fitted a socket here what's that socket now \nfor the emergency power supply we're just going to   run an eps supply from the inverter so just tell \nus what eps stands for emergency power supply so   in the event of a complete power cut this socket \noutlet this is going to help that will become live   yep so they have the customer will have a power \nsupply to run an extension lead and power their   internal compliances in their house okay could we \ndo anything more elaborate with that could we have   dedicated circus in the house run on that so what \nwe can do we can actually put a contactor in and   then put designated circuits in the property via \nthe contactor so we can use some of the circuits   to be powered by the battery system so if there's \nlike a chair lift you'd obviously make that a   priority circuit that would come on in the event \nof a power failure still work yeah all the lights   yeah all the lights and the sockets that wi-fi \num sockets that the customer needs to be useful   wi-fi yeah so we've got a chair \nlift or wi-fi we'll pick the uh yeah   okay it makes sense so that they've got one \nsocket in this system here this twin socket   here vent of a power fan you could have like a \nfridge or a freezer in this garage area we've   plugged in there would be permanently \ndone yep this is just the eps lead i'm   just going to put it into the output and \nthen run it down to the double socket so   so you've made that a bit of flex obviously flex \nplug on the end of it just nice and easy to make   clip it straight into position into position go \ninside and then the other engine and that'll run   down into the socket ready to go and that one \nwill be on all the time when the power's off yep this is the clamp for the ct clamp \nthis measures the current and the   property so this will tell us whether \nwhen the batteries need to discharge   doesn't matter which of the towers you go on \nit goes on to the live conductor always face   the arrow always facing towards the sun you \nsee that arrow see it on there just inside   the middle okay yeah so yeah it just goes on \nin here like this that clips and holds itself   in position position like that yep and then \nwe'll just dress the cable back up and over so we've had some fun together pulling the strings \nin and they're rooted around into the roof space   and you've brought the two sets down to here for \nthe isolator we've got to identify which ones   which do we know which one's positive and which \nwe're going to test them so we can get them all to   get the correct polari okay and then from the \nisolator obviously we go into the uh grow watt there's a juicy connection there for \nthe earth just talk me through that   so literally we just got earth the batteries \ndown um so let's because they're all class   one so making sure everything's up \ncorrectly uh linking both together   to the inverter itself and they come pre-made \nthose leaves pre-made ready to go yep so the   strings are single core six mil yeah and obviously \nwe need to be able to isolate them just remind me   why i need to be able to turn off the dc coming \noff the panels it's just a form of maintenance and   indicator of an emergency if we can isolate them \nfrom here so just to make safe and stuff like that   so these isolators are for dc um is there anything \nspecial about a dc isolator compared to an ac one   a dc isolate is rated for the currents as \nit jumps a lot dc currently opposed to ac   so they're rated for that so i'll see if it had \nan a if you just put an ac ice layer on a dc   cable essentially it could um it could \nactually burn out and it's not rated for it   currently looking for strings off the \nroof and the cables that we've brought   in so we can bring them together any \nprecautions with the ones from the roof   just make sure obviously not touching each \nother and just be very careful see when   you're making them off just make them off one \nat a time and um yeah just be very careful and   just for those people who are watching \nthis why you gotta be careful with the   ones coming off the solar panels because it was \ndaylight solar as always panels are always live   the minute that panel went on the roof and it's in \ndaylight it's actually live isn't it correct yep okay we're going to strip us down ready to go   and that's how we can join the strings together \ni might tuck that back down in that fell actually   a little bit more one set obviously this set here \nis live isn't it yeah it's live yes it's gonna be   ultra careful when you're stripping the back is \nthat why you stagger them as well so it's nice   and what's the same you've been using all day \nwhich i really like about crossing the summit   brothers don't cross the strings okay and we've \nhad across the streams a big conversation about   ghostbusters as well today so we're stripping \nthose back obviously they're different lengths   they can't touch they do touch what we like to \nsee a big spark because obviously those panels   are permanently live when there's light falling \non the roof and it's a bright sunny day you're   going to do a little test for me now yeah we'll do \na little test what's this going to prove just test   which one's live and positive and we've got a feed \nand we've got 292 minus vaults so the positive   is in the left hand on my negative test lead okay \nso if you'd had the leads the other way around we   would have uh not had it as a negative showing is \nthat correct yeah yeah so now we're going to join   this together with a little crimp and then there's \na plug and play system isn't that yeah it's called   mc4 crimper i'm using mc4 crimper tool just to \nmake sure the connections are nice and sound and   not going anywhere so this goes on the end and \nthen effectively comes the plug and play system   yep so literally put this like this like that \nand they are solid so it's not going anywhere   okay and then is the rest of the house yeah \nplug it in and you do that four times so   two two on each yep two on each so they're \nall ready to go ready to plug in job done back on you've got to use mc4 crimpers you \ncan use anything else it's not dangerous so   yeah these are slightly different to the crimping \ntools it's slightly different because the teeth   um there's a little lip that bends over and that \ncauses this to happen the bend at the bend so   then it gets a solid connection so they're not \ngoing absolutely anywhere and because we left   our isolators in the off position down at the \nmains end where we've got our factory setup etc   we're obviously not got an issue with going \nlive there either have we at the moment no so just clip them together come together like so   and lock into position and then again we've \ngot the ability to if we had some maintenance   we could disconnect from me and remove the panels \noff the roof can't we yeah exactly that okay so we   haven't got a rip out obviously the continuous \nwiring system down to our batteries obviously   that would be a huge amount of cable to take out \nwouldn't it for that process so they're connected   there there's some stickers to go on now isn't \nthat yeah so these indication stickers ali yep   i'm up here so you can see them so a bit like \nuh your luggage at an airport luggage at airport   just indicating what's what maybe i'll save \nthat one for the other one so there should   be no confusion that that is not a sky tv no \nyes we'll get upstairs and start firing up more labels yeah more labels we're just labeling \nup the main isolator this isolates the ac to the   hybrid unit up to there any more to do while we're \nin yeah we've gotta do we've got an inverter label   i've gotta label the inverter up explaining what \nthat is yeah yeah just explaining what the unit is   okay i don't think we'll get confused with a gas \nboiler would we no anymore yep we've got some dc   isolators so pvra decides layer so we've got to \ndo this one so there's two of those two of those   these don't sometimes fit the best but \nthen we'll try one of our dc strings   and then obviously you can do the one next to it \ndo you label the cables that come out with the   bottom of the grow watts so these black ones \nhere which obviously are part of our strings   do you ever label those yeah we're going to label \nthese ones with a dc mains voltage string as well   so because these are always live during sunlight \nso that's similar to what we've just seen in the   roof yeah so we'll label these up and we'll first \nwe'll make them off then we'll label them up   so basically we're just putting a sticker on to \nindicate there's pv on the roof so everyone knows   the solar panels on there okay that's that's well \ni've got solar panels sticker is that what it's   all about so look at me i've got solar panels or \nis there a better reason for putting that right   by the main zen kieran it's just an indicator so \nobviously um if people are isolating stuff there's   still an indication that there's live cables \npotentially coming back through to the mains   so if i'm working in the consumer unit where \nthe obviously this supply comes into it it could   be live from the top of the circuit breaker \nis that right correct yeah so that's a good   way of indicating it's on the one up here in our \nspare way here so we can isolate them correctly   and lock off the appropriate breakers to make \nsure everything's safe so because you've got two   sources of energy it's not i've got a nice solar \narray it's actually a sticker that's required   this one here just another one as well just \na indication if anyone's working with it you   can sign it and isolate the mains we're \ngoing to measure the voltage at this end   as well yeah we're just going to measure it \nnow to make sure what voltage we've got here   so we've got 295 volts so upstairs we've got 296 \nso we've just lost one volt and that was about   a 25 meter run that we put in yeah correct yep \nso people shouldn't worry about the vault drop   from those panels should they no not from that \ndistance now the same process of what we see in   the roof space we might be able to see a little \nbit clearer now this crimping action won't we   yeah so we're going to actually all we do we've \ntested out when we've turned our string on tested   which is positive and negative we literally just \nslide on the mc4 crimp there get our crimpers   and that makes a solid connection ready to go \nand the rest of it and then obviously just plug   and play again plug and play yeah but this time \nwe're actually going to go into the unit itself   yeah into the layer itself are they polaritized \nthere as well yep they have got to be polarity   conscious so what the system will not operate with \nthis wrong polarity so which one you just put in   there that's the negative that's the positive \nand i'll label these up with some tape as well   so brown and gray so we'll do that for both sets \nand then we're ready to uh we're ready to rumble   yeah we're gonna do the other set now so we just \nmeasure this off and i'll zip tie these up neatly   and this is why you said you would add another one \nof those stickers even though it's only coming out   yeah we just identify all the time just to let \neveryone know what it is and what it's doing so you can just drop that set \noff twist them up single core   one's positive one's negative join them together   into the grow what and i think we'll be going \nyeah we'll be going live will we yeah not far off so one more label here then yeah one \nmore label i'm going to wrap this round   dc strings to indicate i don't want each one so \nit's a little bit easier as well stick that one   on again indicating that when light is on the \nroof they will be live they will be live indeed yeah lovely so they're all indicated \nready to go so we're going to turn   it on yeah we're going to turn it on we're \ngoing to let you just flick these cells on   we'll turn these strings on so you turn \nthe strings on from underneath and the two   isolators so actually there's three ways \nof voicing three ways of isolation yeah   so you could isolate it from there you can \nisolate the array from here yeah yeah okay   just have a little see and see what we're um \ni've isolated the ac at the moment just to see   and get these batteries charging off grid ah so \nwe're off grid so we are not putting this into the   property now at the moment um it will say no it \nmight come up with a warning line um just indicate   there's no ac present but this will come up in \na minute and it'll start charging the batteries   you're showing me two panels on the left-hand \nside both strings both working correctly yeah and   there's that vault which we saw wasn't it yeah now \nit's going to check in and it's going to go into   the charging mode which it's doing now so that \nis now charging yeah any minute now we'll just go   into charge mode there we go and the batteries are \ncharging if you look at the batteries you've got   that see a nice flashing led nice flashing green \nfree energy charging into these from the sunlight   and then with a little leaf as well do we know \nwhat rate we're going into the batteries out uh i   believe it's 1200 watt per string we're generating \nthat let's have a little look yeah 1200 and 750   welter into those batteries so that's nice free \nenergy from sunlight yeah yeah so as you get to   the end of this video hopefully you're deciding \nwhether a solo around battery storage is for you   or you were intrigued by the process have a kieran \nwhat are they saying to you when they ring you up   and how long does this installation actually \ntake to do this installation is an in-roof   16-panel integrated system so we've had a team of \nroofers here myself today doing the connections   testing the array making sure everything's sticky \nboo this end so a two day start to finish process   all in done two days that's the moment i wanted \nto hear from karen two days to do this install   and would you say it's a process that customers \nshould be worried about or what i've seen today   it's actually quite a straightforward system \nnot not at all so it's an easy process we work   all the way from the beginning set up the \nprocesses how we're going to do it set the   scaffolding right everything like that so it's \nnot a nice straightforward process and there's   also an app at the end to control the system for \nthe customer as well but as we stand here with the   batteries behind us they're fully charging up \nat the minute but also we're running the house   as well aren't we correct yep so we've got enough \nsurplus power to feed into the house and also feed   into our battery cells i'd like to thank you \ngear and have a great day thank you very much"

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"VideoID": "2893",

"Title": "HVAC: 50 Gallon Rheem Electric Water Heater Installation (Electrical &amp; Plumbing Installation) DIY",

"URL": "https://www.youtube.com/watch?v=4qRLQpt9\_w8",

"Keyword": "Electrical panel installation",

"Transcript": "hello everyone and welcome to jumper man Tech where we specialize in HVAC but do everything DIY and today we're going to be installing an electric water heater thank you to everyone tuning at the jumper man Tech today we're going to be installing the stream electric water heater this is a 50 gallon tank and it is pure electric here's the old boiler we're going to be tapping off the water line coming off here as this is going to be discontinued this is the corner we're going to be working with we're going to be getting rid of this right here so we make some space we're gonna have to run new electrical and water lines we're going to start with the demo of this right here so we make some space make it look nice and clear it up and we're gonna set the new hot water tank so we know where it's going to be and from there we can start running the electrical all right got some space and from here let's go ahead and stand down our new water heater and figure out a nice place for this all right we're thinking right here this is the spot your washer and dryer here got a pressure tank for the well hot water heater down there's a breaker panel we're gonna install a new breaker and we're gonna run power over here and you know what we could put a little switch here a double pole they're going to be 208 and let's go ahead and start running the electric I'm gonna clean up this wall real quick and at the same time we're gonna need to get water and our water is going to be right here this is our cold water supply this is where all the hot water for the house is coming from before so we need to take this line cut it and that's going to be our supply line for this heater so let's go ahead and get started let's do the electric first here's our breaker panel this wire and old breaker is for the old system now we have space for a two-pole breaker foreign I want to go off the top and just run it along here where there's other BX let's start by putting in one of these connectors with the bushing and just put lock down the locking ring foreign [Music] and I also grounded It On The Ground Bar so as far as right here we're good now let's just neatly run our BX along the wall I'm making my way around I'm gonna drill in here I'm gonna add in a switch and we're over here we'll run our power comes into here a box on the wall everything's looking neat we gotta run a switch into here so we got a two-pole switch and here's our power let's go ahead and set that up all right we officially have power everything looks nice and neat I like the switch so from here this is our cold water supply and this is the hot water and this is a relief valve Thermal Pipe this way we need to get our water supply and here's our cold water supply so we have to cut this shoot this this way and run across there and then it's going to be the hot water supply we're gonna have to cut this here and then run that also this way and loop it in got a half inch water supply this is three quarter so we're gonna go from three quarter and a half inch and what I want to do right now is just dry fit exactly what I need to do Build It Up and see what how it's gonna look like and then I'll start making my connections and soldering everything all right so here's the dry fit it's looking really nice here's the electrical looking real cool so this is our relief valve and do something like that here's a little pressure tank Supply it's nice and neat so let's go ahead piping this up and we'll just put some Teflon on here let's go ahead and start building up this kind of pipe all the fittings and pipes are sanded but I need to apply flux so let's go ahead and build this all up before I can start soldering as far as these I brace these connections and tighten down the threads so from here we can continue to build so I'm just flexing my fittings and pipe and just building and whatever XX XS flux I have I wipe it away only one inside the fitting some wet Rags here let's go ahead I got these two set up up to here and now we can continue so let's go ahead [Music] foreign [Applause] foreign [Applause] wipe away the XX flux so everything's nice and neat and we're just going to continue here foreign foreign foreign [Music] foreign tank is in this is all in nice and straight cold water supply hot water supply the only thing I left to do is to solder this up but right now we can test our main line for leaks all right we're filling up the tank see if there's any leaks I don't see anything right now all right we got no leaks so from here I just want to finish doing this and we're going to be ready for the startup just opened up the sink to get the air out [Music] got the electrical panel back on let's go ahead and turn on this breaker all right pulling 18 amps so this thing should be heating up soon for now I'm just going to finish up the relief valve piping then I started this one piece let it cool off then put the Teflon tape put it on there and then we can continue piping [Applause] prefabricated I think we can get it on here the reason so is you don't want to melt this Teflon so we can tighten this down put a wet rag here and then continue building let's finish this up everything's all sanded down putting into flux and that's it we're almost there all right everyone this is it tank is looking great piping looks awesome finish this and we can wrap it up just got to give it a little bit of time to heat up and that's about it if anyone found this video interesting or helpful please drop a like comment and subscribe as I come out with new videos every week I'll catch you all next time [Music] foreign foreign [Music]"

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"VideoID": "2901",

"Title": "Sonnen Battery storage installation for solar panels - uk electrical installation. Smart energy pt2",

"URL": "https://www.youtube.com/watch?v=dvbU85ljGH8",

"Keyword": "Electrical panel installation",

"Transcript": "welcome to the second video on the subject of solar PV DC storage and DV charging in the first video we looked at what happens to solar panels on the roof and how we get the electricity out of those solar panels and back into the AC system again what we're gonna look at in this video Gary it's all well and good producing electricity on your roof but with limited feed-in tariffs and probably us out all day long how we're going to harness that energy and store it is the next part of the video so in my video we're gonna look at DC storage so we're gonna go and look at some big batteries yeah we are let's go so we're come inside we've st. Joe upstairs to fumble around in amongst the luggage in the roof space and I'm here with Sam from over electrical hello Sam Sam's gonna I think give away some of the mysteries of the DC storage but before we do that Sam can we just explain some of the basics beyond the electrical install yeah of course yeah so we've installed a new lured in board which contains everything that's needed for the solar and the battery side of things we think of an issue isolator to if there's ever any MIT and it's worth it needs to be done on the on the battery will isolate that power going to the battery we've then got a TP link here providing the internet connection for the battery just because the the hardwired route was was impossible so we've got a tp-link doing that and yeah the board contains all the fuse and everything that's required for the for the battery can we have a look at only Android there so I can see we've got a 16 amp circuit breaker bringing the feed in from the solar PV on the roof yeah and that's 16 amps I you see coming in yes yes and I can see you've also quite wisely installed some surge protection devices and a lot of electronic equipment in this installation here there is a lot yeah so it's obviously mythical to everybody out there that we're gonna be start storing our electricity and the first thing I've got there is you're still bringing down from the roof AC yeah these aren't AC batteries are they no no there's no D so yeah AC can you just explain that story to us them yeah so basically the solar comes and comes down from the loft as AC the the solar inverters up there so that generates and takes the DC generation for the panel's converts into AC power that then feeds down here into the circuit breaker you just mentioned yes that then is fed to the loads in the house lastly but if there is any X extra solar power that can't be fed to the lords in house the battery kicks in and sends the power into its into its star battery module so let's pray they're down so let's say we're producing 10 amps on the roof the house is using eight of those amps and that means 2 amps will go and be stored in DC in the batteries here is a how low how simple what what's the control system that's in place so the the solar isn't actually reroute Li through this battery or anything like that the solar is just another circuit on the electrical system and the battery exactly the same the battery is just another circuit on the electrical system but what what the battery does is it monitors how much solar has been produced how much consumption the houses is using and then it's able to work out how much solar is if there's excess solar beam generator if you take the example of there's a thousand Watts being generated on the roof yeah there's 500 watts of demand in the house has 500 watts that the solar would previously been sending back to the grid and that's really important sending it back to the grid and the likelihood is that we wouldn't get a feed-in tariff or that know you'd get a very under 50 meters customer has they get they get paid half whatever they generally get for peace if you can use all of that power it's more beneficial and in the day time when we're all out of work obviously that 500 you described there now needs to go somewhere and that's what's going to get an effectively diversity but it isn't diverting just knows that amount of copper that most of the battery as soon as it's made that calculation about fabric what's that it's been sent back to the grid the best got right there's finder what's that I can have so the battery just creates a demand the fireman watts okay so the the the the inverter inside the battery just switches on fireman watts and it then converts that back into DC light you see the batteries of DC batteries and puts that power into the into the battery modules for use later on behind a man is there a CT clamp or meter or something you can do that for yes so there's a CT clamp on the main in Quinn supply yeah which is monitoring the consumption in the house okay and then within our our luden board here there's a CT clamp on the on the solar circuit as well okay that then feeds the information back to that a little meter here the modbus meter so that then it communicates with the battery by a cat5 cable to tell the battery what's going on in the system and therefore how much energy to draw in the charging process yeah after discharge if you have the opposite scenario so in other words if all of a sudden consumption in the house started to increase and the batteries were ready to give off their you know energy back in deinstall what's the process in Reverse yeah so if you take the example of before we had a thousand watts of solar and find what's consumption yeah say that the solar still produced in a thousand watts but the house is now needing 1500 watts of power so now the the solar isn't sending any power grid is sending all of its power that it can into the house and taking up the thousand watts so now we've got 500 watts of power needed in the house so sort of by not in like would have previously happened the battery goes right I need to discharge that power into the house to stop the customer buying in any power so it's just the full process in Reverse the power comes from the batteries through the inverter and feeds that find the watts into the house so it's it so we take an electricity from the roof we've come down the excess energy of AEC has been converted to DC in the batteries yeah on which we need it you just convert it back again back to AC and back out again yeah is there any losses in that process there's small losses yeah yeah there is through small losses with any anything anything that's got transformers and things like that there is always gonna be small losses but they are small and these the Solomon batteries might happen you won the best out there but yeah there is losses in in short but not very big you mention those batteries coming for those me yeah look [Music] so Sam we're inside the sanan DC storage bank and there's always always say to Joe I'll throw you a bone if you want to explain what's happening in there for me yeah cost yeah so right at the top we've got the inverter okay so that well if the battery needs to charge that'll take me AC in from that from the system on that created demand that we were just talking about in the battery to charge and convert that to DC power and put that into the batteries and then opposite to that that's all sort of piece of kit that takes the DC power from the batteries converts it to a AC power and puts it into the house if there's if we need to discharge the battery it looks really complicated so the electrician is watching the video that might always have it's all above and beyond me electrical connections that you made you talked about being in the top of the actual ya know what the connections did you make yep so what we've got on the top we've got the the AC cable in and so that acts as the root for the power to be sent into the battery needs to charge okay and if the battery needs to discharge it's the route back into the house for the power so one cable one here okay let's warm you cable any others and we've then got to cat five data cables one is by the TPM that we mentioned for the internet connection to the battery so we can monitor it and someone can look at it as well if there's ever a problem and also the customer and the there's a comms cable as well which goes to the little meter in that in that Bob I mentioned that does the calculation and that transmits the signal of how much power it needs to be recharge it with our discharge so the fear from the electricians point of view should be zero so we're talking about one cable feeding it both in and out and to cat5 cables yes done that's it have we given away the the mystery now everybody in the streets gonna be putting them in and out yeah the electrical installs not as complicated as it looks inside here it was really self building inside here or was it built long yes your when this system comes it comes as this is a 15-kilowatt system so there's it's this top cabinet they includes the inverter that has capacity to stop by kilowatts of factories so each one of these batches is 2.5 kilowatts okay and so you can just get the 5 kilowatt cabinet and put a fire clock system in but you can also buy this extension cabinet here which allows for another tank lots of stories of 15 kilowatts is imagine you can install so that comes as that the case comes and separately boxed up each battery module comes separately boxed up and the extension cabinet comes separately boxed up so to actually install it like with a lot of things you install the case on to the wall first tell me some really good fixes because there quite a bit of weight on it and then install the battery modules one by one obviously and all but all the DC cable cables everything come with the kit so there's not all this wiring in here yeah it comes with the kit so it's more flat pack furniture Tommy instructions in order to play together so some other than the solar around the roof is there any other way I can utilize the benefit of having DC storage at home yeah yeah so we can actually set this to charge up overnight this customer has an off peak electricity rate so they pay around 4 pence per unit from I believe it's midnight till 4:00 in the morning around those times so we can actually set this battery to charge up on that 4 pence electricity overnight and then during the day when their payment 15 16 P it'll discharge that cheap electricity into the property because this time of year winter time there's only a limited time much solar power can be produced anyway so if we can utilize this battery to charge up salami to buy the power in but they're buying it in at 4 P and then using that to cover their loads during the day when there may be paying 1516 peak so there's an instant saving there that can be made that's really clever that's like the I don't know the economy 7 when we set these like storage heaters yeah education technologies like that a lot to thinking behind that so this customers actually got the most amazing benefit out of DC storage because they've also got an Eevee you know battery powered car outside so is that what you're finding that the the Installer of solar PV DC storage is also need to have in obviously are battery powered vehicles yeah yeah it's all becoming part of like an energy package really so as people move more and more towards electric vehicles they're obviously getting rid of the the fuel to power those vehicles being diesel or petrol and that's adding cost onto their electricity bills but we've kit like this we can then start to reduce those bills as well so it starts to save the customer more and more money because if we can reduce the bills of their electricity bills it means that the car cost them less to run and their overall there are all electricity bills are a lot less and there would have been if they didn't have something like lists it to star all that power so look you do more Joe said probably upstairs in the roof you're going to be driving around on sunshine sound that's it yeah that's it yeah drive around sunshine whilst also powering you you washing machine whilst you're out at work on sunshine as well so it's a yeah it's a really really smart system so as we look at the market developing do you see this being a strong indicator of what you'll be doing more and more of in the future yeah this is this is only the start of this industry really and previously there's a lot of box moving and just like a standard kit for whatever house the reality is that's not the case because everyone's different difficult sumption needs different amounts of solar you can't just box sell this stuff of you know five kilowatts to everyone systems need to be designed for because budget but also their energy needs as well this stuff just self consumption like how this works where it charges off with the surplus and discharges if that property needs extra power is only the start of this when we start getting into buying and selling power direct to other customers and things it's it's a really exciting industry and it changes multi-month so this is just a staff of battery battery installations so you can say that effects are right at the forefront of the changes in the electrical industry as we look to installers becoming now actually producer of electricity rather than consumers of electricity in the modern electrical domestic insulation so thanks to Sam from overall electrical for taking the mystery out of DC storage for me however make sure you go back in if you haven't already seen it the first video where Joe's in the roof space was talking about the solar PV array about the oversize and other panels based on demand what happens to the excess energy that is any and why are they oversized those panels in order to optimize the amount of electricity that can produced in this domestic dwelling you"

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"VideoID": "2902",

"Title": "installation of downlight #electrician #wire #electrical",

"URL": "https://www.youtube.com/watch?v=5o-TOjrwzus",

"Keyword": "Electrical panel installation",

"Transcript": "this video we show you how to install down lights [Music] foreign [Music] [Music]"

},

{

"VideoID": "2910",

"Title": "InSoFast - Electrical Installation",

"URL": "https://www.youtube.com/watch?v=8AQiWKSjHCI",

"Keyword": "Electrical panel installation",

"Transcript": "in so fast A New Concept in engineered [Music] insulation wiring the panel is simple the intersecting chases are clearly indicated on the surface of the panel the network of wiring chases allows the electrician to come in after the walls are insulated making cuts at the panel's indicated inter sections gives you access to the vertical and horizontal electrical raceways the Clean Cuts can be replaced and foamed back in so the walls insulation Integrity is maintained the best choice for your home's insulation an easy to install product that contributes to a better indoor living environment for more information call us at [Music]"

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"VideoID": "2955",

"Title": "What is Electrical Bonding &amp; Grounding and why it&#39;s Important - A GalcoTV Tech Tip | Galco",

"URL": "https://www.youtube.com/watch?v=7mtROtuUwfA",

"Keyword": "Electrical grounding techniques",

"Transcript": "hi I'm Katy with your Galco TV Tac tip bonding is the act of joining two electrical conductors together as part of the grounding process bonding by itself offers no protection but bonding in conjunction with grounding is an important step in the personal protection process by creating a low impedance path back to the source this will will force a large current to flow in turn causing the breaker to trip more specifically bonding is the process of connecting all metal parts that are not supposed to be carrying current during normal operation to bring them to the same electrical potential example of objects that one may bond together include multiple wires wires and piping or multiple pieces of equipment with improper bonding and grounding you will run the risk of having poor low impedance Pathways to ground which will not allow circuit protective devices to function properly a poorly grounded system can also cause electrical noise to disrupt low voltage signals stay tuned to Galo TV for more information on electrical bonding and additional Tech tips make sure to check out our other videos and be sure to like comment and subscribe to our Channel"

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"VideoID": "2972",

"Title": "Protection From Electrical Shorts by Grounding Frame",

"URL": "https://www.youtube.com/watch?v=9DDGNp6Pcv0",

"Keyword": "Electrical grounding techniques",

"Transcript": "I would love to bolt the solar panels on here right now because I'm just so excited to do it but before I do I thought better safe than sorry and I'm gonna ground the system first [Applause] [Music] so I have this old grounding rod kit and I've been hauling it around for years and this is a good application for it so these are two rods they're each three feet long I used to have a third rod I can't find it anymore though I'm gonna clean up the ends and this is a brass splice to a couple the two together and then it has a bolt to pound them in so it's a it's a nice little kit [Music] here's my parts with the ends all cleaned up and the bolt and splice and a corn nut and the other end I did not clean up this one just because that's where I'm gonna pound it into the ground I'm in the back of the array right in the middle between the two halves down here is where the conduit from the electrical trench is coming out I have not yet extended that but that is going to go to the combiner box and so I'm going to drive the grounding rods right next to it so that it's a quick easy connection I've read that it's better to have the grounding rod out here at the array instead of at the building I'm not sure what the reason for that is but that's just what I've read so I'm going to try it now as far as choosing a location I just want it right next to the combiner box so that it's a nice quick easy connection and I don't want to have it way out here where the wires have to run out because I'm going to be you know if I want to walk back here and stuff I don't want to trip over it so I'm going to place it inside the array perimeter just that it's a little bit more protected to protect these threads I'm gonna put this this brass coupler on here and I want to make sure that I protect all the threads all the way down so if if this hangs up anywhere don't don't just say that's good enough because you'll wind up bending the threads take the brass off and fix whatever is wrong so now that that's on they're all away now the end of this copper rod is halfway in the middle and as you can see the steel bolt is longer than halfway you want to drive this in so the end of the steel bolt is actually making contact with the copper or excuse me copper coated rod it's actually a steel rod just with copper coating on the outside so make sure you you run this all the way in and you're not relying on the threads alone when I was younger I used to just hold it and whack away but inevitably wind up missing and hit my hand so to protect against that just grab yourself a board and drill it over then you can you're not putting a lot of heavy force on here see if I if I go and I press real hard wind up bending the rod you only need a little bit just to hold it steady so that you can hit the end of that but now this keeps your hand away from the rod and you can pound it in and you can use the same trick on all types of posts all right once you got that down there and we can take off this bolt here run the next piece in make sure it's nice and tight now unfortunately I don't have any more brass splices it's an old kit so I just have to whack the end of this with the sledge here's my grounding rod and in order to ground the frames on either side of me I'm going to use these little coated copper lugs and they have a stainless steel screw in them instead of placing them kind of on top I was thinking I might end up kicking them or something as I walk so I'm gonna put them on the side and I think they'll be a little bit more protected that way is that there's a little stainless steel machine bolt with a star washer and a little nut with a star washer on it now I'm going to tighten that up so this is number six grounding wire loosen this screw up maybe come in here like this it kind of looks like fun idea make sure I have plenty of slack put this in the ground come up here I'll chop it off right at this point and I'll put this acorn nut on and I'm gonna tighten this up I grabbed extra because this piece is going to go up to the combiner box so I'm gonna toss both in here I don't know if there's any rules against having two wires under the same a corn nut but I've seen licensed electricians do it so I'm making an assumption it's okay all my connections are nice and tight I have about a six foot piece coming off that can go to the combiner box when I install that please let me know in the comments below if there's a better way to do this I'm just doing what I think seems correct you know and grounding the frame and the solar panels are going to be grounded to the frame at their connection points so I think this is okay but let me know in the comments below thank you very much for watching and I love it when you guys can share the videos that really helps out a lot"

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"VideoID": "2978",

"Title": "How to Test for Continuity in an Electrical Circuit Using a Multimeter | Tech Tip 31",

"URL": "https://www.youtube.com/watch?v=E9MsyLZF0r4",

"Keyword": "Electrical grounding techniques",

"Transcript": "what's going on it's james back here with yet another tech tip video and in this video i'm going to show you guys how to test for continuity using a basic cheap multimeter like this one here now this is going to be a useful technique for any of you hobby mechanics out there even the die hard i hate electrics and i don't want to have anything to do with them guys because i was that guy until of course i realized resistance was futile get it [Music] okay okay now you've all recovered from intense bouts of laughter let's take a look at what continuity actually means well it basically means have we got a circuit or not and specifically when we're using a multimeter like this to test for it could electricity flow between these two probes here let's take a closer look so to set this multimeter to test for continuity we need to first make sure we've got our probes plugged into the correct socket so the black one here this always goes to the com or common socket there the red one we're gonna push into the volts ohms and milliamp socket like that the one above it is measuring for large amounts of current and we don't need that today so now we've got our probes in the correct sockets we're going to turn the dial on the multimeter down to the diode symbol so that's that one right there some people do use the resistance scale to the left of that to measure for continuity which you can do but i'd suggest if you're a beginner which i'm guessing you are if you're watching this video that the diode is going to be your easiest option so now you've got the multimeter set up correctly here's how this function works so if you have continuity between these two terminals here you should get a reading of close to zero and this can be confirmed by touching the two probes together like that and as you can see we've got a reading of zero zero one so that confirms a circuit if i separate the probes we get this one reading that means no circuit in other words electricity cannot flow between these two points here now a real world example of how you'd use this would be testing a fuse so i've got a fuse here out of the mx-5 it's good i know it is so when i test it i expect to see a reading of close to zero so one probe on that blade there the other probe on the other and there we go we've got a reading of zero zero one so that confirms the circuit and this fuse is good if you were getting the reading of one that would mean no circuit and you'd be dealing with a blown fuse that needs replacing so that's one real world example of how you'd use this function now what i'm going to be using it for today is to help me in my charging circuit rewire in the mx-5 so let's go take a look at that and i basically need to confirm that the two wires running from the plug at the rear of the alternator go to where i think they do behind the dash here because if you take a look under there there is a lot of wires and before i go cutting and splicing i need to be sure that i'm working on the correct wires now before i attempt any testing i've disconnected the battery because we're testing for resistance here not volts or current so there's no need to have it connected and it also eliminates the possibility of me shorting something out so that's disconnected now i'm going to start at the gray and red wire from the alternator so i've looked at the wiring diagram and i suspect that's running to this big blue connector under the dash here so i've glanced under there and yeah okay i can see a gray and red wire going to that terminal so i'm quite confident i've found the correct wire but let's be 100 confident so i've crimped a spade onto the end of some electrical wire and then pushed that onto the terminal at the alternator end the terminal that corresponds to the gray and red wire and then i've run the wire back into the cabin here and that's basically to get the two ends closer to each other because the probes on the multimeter will not reach that far and then i've also crimped a female spade onto the end of the piece of wire and that's going to allow me to push the black probe into there like that so i don't have to hold it in place and now i just need to switch the multimeter on and then push the red probe into the terminal i believe to be the correct [Music] wire there we go and as you can see we've got a reading on the multimeter of zero so that has confirmed that that wire under the dash goes to where i think it does to the alternator that's good news now for the sake of the experiment there's a green and red wire back there which looks very similar to the gray and red wire if you were colour blind it'd probably look identical so let's test that one in the same way [Music] so there we go we've got a reading of one on the multimeter so that means no circuit and if we didn't already know which the correct wire was we'd have to keep looking for it so now i'm going to repeat this process with the grey wire coming from the alternator so i'm going to nip to the engine bay swap over that spade connector to the other terminal come back in here and then repeat this process in exactly the same way right i've swapped that terminal over and i suspect i know where the grey wire is running to under here so i'm going to test it [Music] and there we go that's confirmed by the reading on the multimeter which is zero that's great so now i've isolated the two wires that come from the alternator and i know exactly where they are running behind the dash here so i'm free to cut and splice as i see fit without having to worry and working on the wrong wires and that's it for this tech tip quite a simple thing but really useful when you start mucking around with wiring harnesses and things like that which if you're working on cars you will have to do eventually you can't put it off forever trust me i tried so there you go if you like the tech tip don't forget to give it a thumbs up and if you want to see more of this stuff subscribe to the channel to stay up to date with any future uploads thanks and i'll see you for the next tech tip [Music] you"

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"VideoID": "2979",

"Title": "Fault Finding Electrical Circuits - Electrician Life",

"URL": "https://www.youtube.com/watch?v=BK6ykUkJ-8A",

"Keyword": "Electrical grounding techniques",

"Transcript": "good morning everyone jordan here welcome back to the channel today i've got a little bit of fault finding for you um customers called me out because they've got this kind of like annex building garage slash annex and it's been tripping out regularly he said basically whenever you plug something in or even like a phone charger it just trips um when i came in so this is the consumer unit obviously when i came in the rcd was off and i tried to reset it and it just tripped straight away so i want to show you my kind of fault finding procedure that i tend to do of how to narrow faults down maybe it will be of benefit to you maybe it'll be helpful to you let me know in the comments if you do things differently and if you enjoy my videos hit a thumbs up don't forget to subscribe and hit the notification bell so that you don't miss out on future videos so basically what i do first is i turn all the circuit breakers off in the case of a tripped rcd dishes when it won't reset i turn all the circuit breakers off one by one then turn the rcd on hopefully it stays in and then i turn the circuit breakers back on one by one and in this case i did that and it actually has stayed on now um but obviously there's probably still a fault somewhere so what i'm going to do is take the cover off and do some insulation resistance tests on the circuits and that will hopefully help me to narrow down which circuit has the problem and be able to sort of narrow it down that's always the goal with fault finding is to narrow it down narrow it down and eventually you get to the source of the problem so usually if you can first find which circuit the problem is on then once you've found that circuit you can go around the various points on that circuit and look to see if there's anything obvious if there's not then you can just take those points off one by one and check until you find the problem that's how i usually do it so it's sort of a process of elimination really um yeah so let me get the get my head torch on and get the board cover off so i'll just i'll go back to the start and show you how it was when i came in so basically everything was on like that all the mcbs were on but the rcd was off when i turned that okay it's doing it again when i tried to turn the rcd on it just trips straight away so what i then do is turn off all the circuit breakers turn the rcd on now it stays in and then one by one turn the circuits back on and so far so good the lcd is staying on so obviously doesn't like just having all that load switched on in one go and hence why it was tripping but that doesn't really tell us what the problem is so i'm going to turn everything off again and then i'm going to take the cover off and do some insulation tests it's full of spiders here it's like um spider city there's just cobwebs everywhere um so it's a crabtree starbreaker board obviously just the one main rcd and then lots of mcb so what i'm going to do first is do an installation resistance test across all the circuits just to see what reading i get so i'll just do a neutral to earth first 250 volts and we've got dead short then if i do the circuits individually so that lighting circuit 0.17 0.02 2.16 200 0.01 200 200 so it's not any of these um but this one was quite low 0.01 um and this one 0.17 this one 0.02 okay right so these three circuits are kind of suspect because they've all got fairly low reading so what i'm going to do now is just disconnect the neutral from those particular circuits right sorry about that the camera cut out for some reason which is really annoying but basically let me show you what process i went through so i um i disconnected the neutrals from the three circuits that i thought were problematic which is these two lighting circuits and this circuit here because these were the ones that had low insulation resistance readings from line to cpc so i disconnected the neutrals and tested those one by one and they were all actually okay they were either like sort of 10 15 mega ohms or even one of them was over 200 mega ohms so then i thought okay what i'll do is just go through one by one and disconnect all the neutrals test insulation resistance between cpc and neutral on all the circuits individually until i get a low reading and when i took this one out which is labeled as circuit 4 this was zero meg ohms from neutral to cpc so i i tested then line to cpc on that circuit and it's above 200 mega ohms completely clear so that's why it didn't show up when i was testing line to cpc now what i've done is turned all the circuits back on apart from the faulty circuit and i'm going to just go and check now around the building and see what's not working and then i'll be able to know what that circuit actually does it's labeled up as lighting up so presumably there's there's an upstairs to this building and it's the lights upstairs but at least we can narrow it down and then check out some light fittings or things that look suspicious so we'll go and do that now right so coming upstairs now and this is what should be the offending area um so presumably okay that switch is not doing anything this switch is not doing anything either so we've got recess down lights halogens in here six ah it's just going to make it fun then we've got a smoke alarm which is kind of broken so that's worth checking we've got a down light here and then two down lights there one there one two three down that side and three down that side so basically i'm gonna have to it's gonna be difficult but i'm gonna have to try and narrow narrow it down somehow i think i'll start by taking the switches off because it's a fairly new build so they might have done neutral uh neutrals to the switches which if they have we can then disconnect the neutrals and narrow it down but if not then i'll check that smoke alarm because that looks a little bit suspect in fact i might do that first and then the next step would be to actually take out some light fittings which is going to be a bit of a nightmare all right so this is actually still live because it must be on its own circuit and it actually looks alright it's just fallen out basically falling out of the ceiling so yeah the clips the clips in the base are broken i mean it's probably out of date anyway replaced before 2015 so it's due for a new one so i'll recommend that to the customer um yeah that's not going to stay i'll just recommend that they get a new one put in but that doesn't solve our mystery so i'm going to check these light switches now let me know in the comments before i find this fault what you think it might be because well you experienced guys out there you've probably got an idea in your head already i mean a dead short neutral to earth to me suggests that there's like a screw through a wire or something like that if it was rodent damage or something else then it wouldn't necessarily be a dead short right okay i was right about the neutrals to the switches they've done it in a bit of a funny way they've put these crimps on which is not great so we've got here um i don't see any damage to the wires though or anything but it can so easily be something as simple as the neutrals being pushed too hard into the back and shorting out with the back box so i'll just check this now and see if we've got a better reading or if it's still shorted out okay so still zero what i'm going to do as well let's do a continuity test right that's interesting so we've got 0.4 ohms so that indicates that is a it's really hard hard down to neutral like there's a direct almost direct connection between neutral and cpc somewhere and the closer we get now the lower that reading should go so that's quite helpful because we can kind of track it down by doing continuity tests i'm just going to zero my leads out to make sure that they are properly zeroed and i'll check that again yeah 0.44 okay so let's check the switch on the other side of this wall and we'll see if we get a lower reading or maybe the problem is just there i do enjoy a bit of fault finding to be honest it's something that kind of really gets your brain going and it's you know like being a detective in a way trying to puzzle through methodically and find out what the issue is it's not something that all electricians are comfortable doing to be honest a lot of people struggle with it but it is something that i enjoy okay so this looks fine as well obviously they have done the same thing they've just crimped these neutrals i've never seen it done that way before but i suppose this is better than doing it in a connector block really so let's check that and see if we're closer or further away so it's pretty much exactly the same 0.45 so i think what we're going to have to do now is disconnect these neutrals and on the other side as well and see if we can narrow it down to one particular cable so i'm gonna have to cut these crimps off and then bring some wire goes to redo the connections so this is where it really becomes a case of you know process of elimination because we're literally now just cutting out parts of the circuit and testing until we find the part that is no good so what i can literally do now is test between this neutral and cpc and that is clear and then this neutral and cpc is dead dead short so hopefully this is the feed out to these six lights in which case that is the problem but what i'll do is cut the switch on the other side as well check those cables because it could be that this is the feed in but the fact that this cable is going down suggests to me that this is probably this is the feed-in and this is the feed out all right so this is the other switch so we'll do the same here just cut these off and then strip these back and see what we get so that's clear that one's clear hopefully if i'm right about the lights next door yeah they're all clear so that's great we've narrowed it down that means it's the lights in this bedroom so i'm going to put a wago on these put this switch back together and then we'll have to start taking out some of the light fittings in that bedroom of course there has to be a screw that's cross-threaded doesn't it every time what do you do actually about this like when you take screws out do you do anything to identify which screw goes in which box otherwise i'm gonna have to re-thread it with my re-threading tool okay so that's back let's go next door and see what's going on this is the part i hate because you just know that when you take these out you're gonna end up trashing the ceiling although they're not fire rated so that helps actually so transform so these are halogens we've got transformers and we've got junction boxes so what are the chances that an earth wire and a neutral wire are just crushed together in the back of one of these junction boxes i reckon that's got to be got to be it really because there's no way that you can have a short neutral to earth on these because there is no earth connection on the transformers at class two so this flex is just a two core flex so it literally has to be either a short on one of the cables in between like maybe it's been damaged somehow or it's in one of these junction boxes this one oh man all right let me zoom in and show you right so this is loose never been connected in properly but they are in the same sleeving together and they do look like they're kind of twisted together so probably the earth continuity is going through to these but anyway they just need popping into that terminal properly so i'll do that now and just to do a continuity test on there and it's i've got a reading of 0.21 so the reading has halved but based on that reading that means that probably if the lights go like that across and back probably it's one on one of these end ones so i'm gonna check i'm gonna check this one do a test and then see it's either it's probably that last one to be honest based on the readings but we'll see okay this has got a different transformer on it which means it looks like the transform has been replaced at some point it could be that somebody took the junction box open and then they've bodged it up when they've done it right that's weird because that is clear that indicates to me that we've got a lack of cpc continuity somewhere 50 50. which one do you which way do you go let's have a look at this one because it's easiest easier to access so probably it won't be this one but it's easy to check again this transformer looks like it's been replaced and these cables are bunched up inside yeah looks okay that is weird because i still got dead short of zero meg ohms but the continuity is is no longer there so it could be that actually something i've done has just loosened up that short slightly oh no there it is again 0.83 now so it's gone up so what do we reckon one of these wires maybe not .82 oh man let me check this one now again 0.78 all right let's go back go back to go back to here see what we've got here 1.83 so we're getting further away so i think it's just a case of disconnecting these cables now right we've got 0.1 meg ohms here now and i could hear almost like a shorting happening within this cable which i've never come across that before and as i jiggle the cable around the mystery continues 2.87 ohms now could it be a bit of faulty cable or you know so hard to tell with these things that's trouble but i've obviously budged it slightly see we got three ohms now 3.3 ohms so something i've done is making the reading go higher so trouble is not got much length on this so i don't want to strip it back too much let's check this one and see which way it's going at least yeah clear so it's going that way so i'm going to check that'll be typical it'll be that last light fitting so that's the cable we've got dead short 3.6 amps so it's somewhere from here to that light there so i can test all the others now because the others are still connected together if i test at the switch here the switch should be clear so this light here this wire here goes from that light to that light there and somewhere on that cable from there to there there is basically a dead short between uh neutral and cpc it's gonna be almost impossible to get a new cable in there because it's got all joists and like celetex insulation so pulling in a new cable is not going to happen they've definitely clipped the cabling up as well just to make it worse so i'm almost at my hour now that i've been here and i just allowed up to an hour for fault finding on this job so i'm going to basically put these other down lights back um put everything back together apart from these two and then inform the customer and they can decide what they want to do i might just strip this cable back a tiny bit more just to make sure it's not just a little fault within the cable there somewhere [Music] all right so all those light fittings are back on now so my final step is just to do an insulation resistance test again on those lights and now we've got 125 mega ohms so that's perfect and if we do the same on the other side 200 mega ohms so we've cleared the fault which means it definitely was that cable but obviously the problem is still there and needs to be fixed so we're going to have to figure out a way to do that but for the moment i'm going to stick our goes on here like so close the switch up and then report back to the customer all right guys so i'm happy i found that it's quite satisfying really to find a fault like that let me know in the comments what you think would you have done it differently a different process and how would you go about rewiring those lights i'd love to know it's going to be tricky because there's insulation everywhere there's joists everywhere so i've actually just spoken to the customer and he's asked me to just put the light fitting back in the ceiling leave it disconnected and then he'll decide if he really wants to get it going again or if he just wants to leave it as it is because it's only one night that's not working at the end of the day so it's not really the end of the world as always if you enjoyed my videos hit a thumbs up don't forget to subscribe if you haven't done so already and hit the notification bell and thanks for watching have a great day okay it's hot again so slight update for you before we finish um actually the way they'd wired the lights was different to what i thought they basically gone from one side to the other like that so it was actually the cable from that light to that light that was problematic um from there it goes to that light over there and then from there it jumps back across to that light there and those cables are fine so it's literally just the one from this light across to this light that's the problem but again it's going to be really tricky to actually re-wire it but unfortunately now it means that those two lights are not working either so it means half the lights in here are not working which is a bit of a shame um but anyway just sort of update you on that obviously things are not always quite as straightforward as you think the brain of another electrician how they wired it compared to how i would have wired it it's one of those things anyway thanks for watching and have a great day"

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"VideoID": "2980",

"Title": "IAEI Training Shorts — Foundation and Basics of Grounding and Electrical Circuitry",

"URL": "https://www.youtube.com/watch?v=Yg4qPB-pY8s",

"Keyword": "Electrical grounding techniques",

"Transcript": "[Music] we start talking about grounding concepts the the the way they were explaining it here is we're going to use a solid footing or foundation to build a building and many times what we use to make our connection to the earth is provided for us already by other traits they may have concrete encased electrodes that are installed they may have metal in ground support structures so this is trying to relate that to a solid foundation of the building we want a solid foundation for our grounding system it's the foundations of it so it functions properly and we mentioned earlier that the reason for grounding systems is to stabilize those systems under normal abnormal conditions and here it says sometimes it's referred to as earthing well some other standards actually call it earthing and the nec is stuck with calling it ground but simply defying ground as being the earth when we solid ground our systems and that's a very common method of doing it we're connected to ground through our grounding electroconductors ultimately getting to our grounding electrodes our grounding electro system and we haven't added any intentional impedance so all my grounding electrodes are going to have to be bonded together we're going to see those rules when we get to 250.50 and that's our foundation of our electrical system many people have heard the phrase electricity takes a path of least resistance that's kind of been a long time phrase but it's actually not true electricity doesn't take the path of least resistance electricity takes all paths that are available most of the current is going to be on the path of least resistance but if there's multiple pairs we'll have current on all those paths and the currents going to divide opposite proportion to the resistance or the impedance typically for our ec systems when we're designing our systems one of the goals in the nec is kind of an unwritten goal is to avoid parallel paths for current for normal current unless we're doing a parallel conductor installation that that's something different but we want current to stay on the intended paths that we provide for it essentially on our insulated conductors we don't want current under normal conditions on our metal raceways or metal enclosures or any other conductive objects and the way to accomplish that is by only grounding our systems at a single point and that's the concept that's all highlighted here obviously it's saying that the the lower impedance path is going to carry more current than a higher impedance path and then we've got rules that apply for how we go about installing those this is just a very basic installation here's a series path now we have parallel paths so the current is going to divide based on all of those paths and same thing here so we've got a source of a supply dry system and here's where the confusion is because the source isn't here the source is the output that's my source of my supply dry system so if i have we're not showing the ungrounded conductors going out to supply something we have a ground fault condition coming back and now if we have multiple paths it's going to have current on all these multiple paths going back to our source so the the wording that's used in a number of different training programs is current always tries to return to the source and i kind of think about it as well i start with a voltage source there's a voltage between those two so the only time current are going to have current is if current goes out and it comes back to this point current doesn't go out to some point and just disappear into the earth i need a complete circuit and that applies to both my normal circuit conditions and also under ground fault conditions [Music] you"

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"VideoID": "2991",

"Title": "Ground Connection: Connect to an Electrical Panel | Electricity",

"URL": "https://www.youtube.com/watch?v=cSVrdMcmDa0",

"Keyword": "Electrical grounding techniques",

"Transcript": "[Music] [Applause] [Music] in this video you will learn how to connect a ground connection to an electrical panel the ground connection makes it possible to dispose of felt currents in other words when metallic masses accidentally become live before this electrical intervention please turn off the power for the network concerned to connect the ground connection you will need a tape measure a spirit level a pencil a hammer a set of electrician screwdrivers a drill a metal saw and a miter box a cable stripper a rigid tube a main Ground Terminal 16 mm s ground ground conductors four screws and four screw plugs and mounting brackets this operation is carried out in three steps as we will explain this operation is done after installing the ground wire to learn more please watch the video how to install a ground rod step one install the main Ground Terminal and the tube take the cover off the electrical panel measure and mark the middle of the width of the panel with the pencil place the tube in a vertical position starting at this point note and Mark in pencil the position of the tube note and Mark with the pencil the position of the mounting brackets above and below the tube at most every 80 cm opposite the disconnecting strip and under the electrical panel note the location of the main Ground [Music] Terminal drill four h holes insert the screw anchors using a hammer if necessary screw in the mounting brackets attach the main Ground Terminal to the wall by screwing it in measure the rigid tube between the main Ground Terminal and the electrical panel cut the tube to size and then attach it using the mounting brackets step two connect the disconnecting strip to the main Ground Terminal under the disconnecting strip drill a hole for the ground conductor to go through this will enable the ground conductor to connect the disconnecting strip to the exterior as installed in Step One insert this conductor into the hole strip the end of The Wire connect the conductor to the main Ground Terminal insert the electrical wire into the terminals and then screw them in step three connect the electrical panel put the main protection conductor into the tube strip both ends of the conductor connect the main Ground Terminal insert the wire into one of the terminals and screw it in to connect the green ground strip at the bottom of the panel insert the stripped ground wire into the terminal and screw it in cut a space out at the bottom of the panel to allow the ground conductor to pass through put the conductor of the electrical panel back on for the rest of this installation please watch the video how to install a ground connection part three equip potential bonding you now know how to connect the ground connection to the electrical panel"

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"VideoID": "2997",

"Title": "Electrical Earthing System",

"URL": "https://www.youtube.com/watch?v=pBup4dn17fw",

"Keyword": "Electrical grounding techniques",

"Transcript": "why does electrical grounding matter so much in industrial plants imagine a world where machines spring to life with a mere Touch where every interaction with a device propels you into a dance with danger where the very air you breathe crackles with static electricity that's the chaotic realm you'd inhabit without the unsung hero of electrical safety grounding grounding or earthing is the process of creating a direct low resistance path for electric current to flow into the Earth in the event of a fault or surge it's the silent Guardian that protects both people and equipment from electrical faults ensuring that the industrial world keeps turning safely there are three primary grounding techniques used in industrial plants solid grounding resistance grounding and reactance grounding solid grounding the most common technique connects the system directly to the ground no resistance no reactants just a straight shot to the Earth this Simplicity is its strength providing a clear path for fault currents and allowing protective devices to quickly clear faults however this technique can also lead to high fault current levels which can damage equipment and create a potential safety hazard next up is resistance grounding which introduces a resistor between the system and the ground this technique limits the fault current reducing the risk of equipment damage and improving safety but it's not perfect the resist can heat up during a fault leading to potential failure and the lower fault current can make it more difficult for protective devices to detect and clear faults last but not least we have reactants grounding this technique uses a reactor instead of a resistor to limit fault current the reactor adds an inductive element which can provide additional protection against transient overvoltages but just like the other techniques reactants grounding has its drawbacks the inductive element can create a residence condition potentially leading to higher fault current levels and more severe equipment damage each of these grounding techniques plays a critical role in industrial safety and each has its strengths and weaknesses solid grounding offers Simplicity and fast fault clearance but can lead to high fault current levels resistance grounding provides fault current limitation and improved safety but can struggle with heat during faults and detection of lower fault currents reactant grounding adds an inductive element for additional protection but can risk resonance conditions and more severe faults so the next time you flip a switch or press a button in an industrial plant spare a thought for the silent guardian of electrical safety grounding it's the invisible force that keeps us safe and the unsung hero that keeps the industrial world turning and remember while each grounding technique has its place the best choice will always depend on the specific requirements of your system so Choose Wisely and keep the lights on safely"

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"VideoID": "3006",

"Title": "2016, Season 4 Episode 9, Electrical Work",

"URL": "https://www.youtube.com/watch?v=5v-zspX\_VMA",

"Keyword": "Electrical grounding techniques",

"Transcript": "thank you [Music] hello Hamilton it's that time again get up get off the couch and start talking to your own to-do list I'm Bob acid Orion welcome to another episode of the just ask Bob show today we have gone at great lengths to provide the most informative show we can it is all about electrical and what what creates every show is the viewers it's your emails I've put together the top three emails I've received in the last few years ones that come in quite often as multiples or duplicates regarding electrical so they seem to be some of the most popular questions coming in from you the viewers first one is hello Bob I want to know what do you think of the new slim LED pot lights it appears that they only need a half an inch clearance and can be installed directly under a joist from Ted in Hamilton Ontario well thank you Ted for being a part of today's show later on through the show we're and actually install these pot lights directly under a hole that's been cut directly under a ceiling joist and they're going to fit hello Bob my insurance company is giving me headaches headaches about my home's knob-and-tube wiring Bob can they do this to me Nancy Dundas Ontario short quick answer Nancy is yes they can you know this is very interesting with knob-and-tube wiring I want to briefly make the statement as far as the provincial body the ESA the Electrical Safety Authority is consider their thoughts on this is yes they are legal knob-and-tube wiring there's nothing wrong with it the only issue is insurance companies you know they're for profits they have to make profit so they're a private entity a private business they can lay the smackdown on you and if they want to not insure your home because it has now been tube wiring then yes that can be an issue Nancy between you and your insurance provider we'll get into that a little bit later through the show final question Bob how many sub panels can I have before it becomes illegal my home is going to be up for sale shortly and most likely Bob is going to be a home inspection will I be in trouble my main feed my main panel is a fuse box this is from Anthony in Hamilton Ontario Thank You Anthony for the question and again later on through the show we're going to not only show you you know what's going to be very familiar in a lot of older Hamilton homes the original fuse panels we have one on today's show we also have a series of sub panels beneath it our electrician explain why that is done that way and we'll also show you a large modern circuit breaker panel which is important now let's jump right into Bob's be where's and Bob's top picks we have here a variety of light bulbs now here we have an incandescent bulb you know these have been used for ages this bulb does nothing but give off heat it gives off more heat and light output so this is definitely it Bob's be where you don't need these bulbs one way to look at it is these are initial cheap cost there's nothing to initially buy them and put them on all your fixtures however month-to-month you're spending a fortune hydro now the opposite would be the LED you know the LED bulb comes in a lot of different shapes you could actually have six of these for the hydro costs with one of these right now there's a big difference big money savings here this is my top pick for the show the LED bulb now another bulb to look at which is a real serious Bob's beware these fluorescent bulbs honestly I believe there should be out of everybody's homes these bulbs are rated as being safe and safe that's other manufacturers without in them now the problem is when the bulb breaks you can have mercury leak out of the bulb that can be a serious safety issue in your home so you know you have to think about it the back again with the LED the opposite of this one this will be an upfront cost however the savings are going to be seen on your bill month to month down the road so you must try to shut shop smart when you can now we'll take a moment quick shout out and thank you to our sponsor The Home Depot you know whether it's the tools we use or whether it's the light bulbs we display on the show they help us out each and every month with some of the materials and some of the products that we display and show on the show now you're going to notice not too many tools today that I'm showing off for the homeowners and there's a reason even though as far as the Electrical Safety Authority the ESA as far as they're concerned Hamilton homeowners you can start running wires throughout your home you can start changing your channels as long as you have a permit so the essay is going to send out inspector and they're going to look very carefully over everything you've installed if you pass good for you you must have studied well unless you're an electrician if you don't pass you have to correct it then they come back however even with that being said I do not recommend Hamilton homeowners tinkering with electricity and wiring for the simple reason that there's better projects to work on one is plumbing you mess it up you're going to get your feet wet you mess up the wiring you can cause a serious issue death bodily harm you can even burn the home down so please you have to be careful that way now coming up after the break next we have John ten brink master contractor electrician licensed electrical contractor now he's going to be on the show he's one of most popular guests from season three and we're going to tackle some of these questions that came in through the email we have a breaker panel we have a fuse panel we have knob-and-tube to discuss up next wondering how the latest decisions at City Hall the school boards Queens Park and elsewhere are going to affect your life we cover all of these on city matters to occur the fair show right here on table 14 you've been asking for the federalism Shaffir soon in at noon for 6 or 10 p.m. and look for engaging local discussions that will inform and explain it got to be a team to move the city forward that City matters only on cable 14 and cable 14 now calm it's a rape whistle the Canadian Women's Foundation moving women and girls out of abuse and poverty and into confidence hello Hamilton welcome back on today's episode we're talking about electrical we've got panels sub panel spotlights everything on today's show let me welcome my good guest and my good friend John ten brink master electrician and a licensed electrical contractor John speaking of licensing you know during the break earlier we were talking about creative very creative the phony electrician televiewers the story you've got the license to tell it well this interesting gentleman decided to forge documents to act like an elective excuse me electrical contractor he I think he operated for six to seven years that way he finally got caught he is now going to jail and paying a massive fine if you're looking for credentials for a licensed electrical contractor the ESA website which I believe is ESA safe you can check all the credentials make sure some guy is legitimate that's important it's important I mean there's a lot of Road contractors doing you know what I do pedaling my type of business but with electrical people got to be careful that's funny you mention that because I was at Home Depot this morning and there was a stack of drywall stack of insulation wiring and boxes all I could say is that general contractors are not allowed to be doing wiring work if they recommend it I would suggest going with that guy well I'm a general by nature general contractor do I touch wiring no that's when you come in on any job that it's required Jon let's start with this guy here because my mom has this box yeah this is very popular in Hamilton's fuse panels I'm going to tell you honest truth the true definition of a fuse panel is actually safer nor what we used today but the problem is that there's no safe keeping to it we can mess with it as we were talking about earlier the Archie Bunker story sticking a penny behind the fuse and it won't blow so this is just your simple panel what we have inside here usually has a door this one was taken out from a previous job so we wanted to use it as demonstration piece is we have all our fuses and they just screw it like this as we all probably know now as you can see these are all 15 amp fuses except for our big compartments which is our stove and dryer but the important part is 15 amp fuse this wire that's inside here is all 14 gauge rated for 15 amps now it's very easy to put a 20 amp fuse and all you're asking for is a fire then I've been popular in Hamilton is when this gets full because nowadays we use a lot more wiring than we did when the houses were built and instead of going to the extreme of changing the panel they decide just add sub panel and sub panel and the problem is is that the wires that go between the sub panel and the panel aren't actually fused they're just tapped into the main confuses as you can see what happened here is why we took this panel out all the distortion the fire this thing pretty much was burning itself up so honestly it's not that expensive it's a lot safer and your insurance companies will prefer it just change out the panel this is our new 100 a.m. panel this brands by Siemens it's a very good very popular brand so what you have here is you have 32 full size spaces but the nice thing about it is if that gets full we can buy condense breakers and put in half size breaker I see okay well we got some breakers inside so basically for you basically what we have here is this is our main breaker inside this compartment right here I don't even go in there and unless I got the power off do never go in this section this is uh this is very dangerous up here after this it's protected by this fuse breaker sorry right here we have our ground bar we have our neutral bar and this is where we install the breaker so these are just a few different types of breakers this one actually matches this panel these are some older styles now both of these manufactures are no longer in existence this one is federal stab lock this one is commander if you have these the biggest problem is is that you can't expand on them like I was just describing so this is a Siemens breaker all it does is go in the panel like this and you're done now make sure the power is off before we ever do this now this is a 20 amp for kitchen outlets before I was just preaching about 15 amp stuff that's what we use nowadays this makes a much cleaner safer install home inspections and insurance companies really don't want to see fuse panels these days well that's what's interesting to me you know when I look at the fuse and obviously I look at the breaker you know is what the V is with the viewers email question insurance company is giving her some grief you what is the main reason you believe wise insurance company some of them not insuring Hamilton homes that have fuse of handle still well as we were describing it's very easy to change this to a 20 or 30 and the wire is only good for 15 oh yes you have to be rewiring it mentally can't just change without dismantling that's correct at the average home owner can unscrew it and put in the wrong one that's right interesting okay then we're going to do is a knob and tube description now now this is still very popular in Hamilton extremely we do this quite often so this is basically what you'll see when the demolition has been complete I got a little pointer here I'm going to show you this right here is actually what the tube is this is the knob so what they did is they ran the knobs so that would not the conductor would not be in contact with the stud and we went through joist we use these tubes knob and tube by itself when it was designed was actually a great system the problem with it is when we install knob and tube before the 1935 ish is that all we had with a table lamp nowadays we have computers we have heaters we have all the stuff that this wiring was not designed to handle how we need to certainly change the power there's a certainly change so what I have here is I have a piece of wire we use today this is called n md-90 romex of people called so this is what we call our our live conductor this is our neutral conductor and this is the important thing the ground with knob-and-tube we had no ground so for shock hazard and fire hazards that's the biggest problem with Dobbin tube so nowadays we replace it this and basically these two conductors are basically those two running up and down a joist so knob-and-tube as Bob mentioned before ESA standards there is nothing that we makes you require to change the oven to but if you have if it's existing it's completely legally it's fine the problem with insurance will not accept it much anymore without specialty expensive insurance is because there is no grounding over loads our circuits aren't very well we have one receptacle in a bedroom so the idea behind it is its we do this quite often that was change out knob into it's a much safer again before it just wasn't designed for what we do today can you give our viewers an idea of the extent of not only wiring but damage to wall ceilings what we do at home it's a very labor-intensive job it's a little bit dusty now we don't have to take down all your walls to do this we do this with all the walls up what we have to do is make some smaller fist size holes sometimes we'd have to do channels depending on that but we always try to keep it condensed and then we usually bring in Bob to fix it afterwards but so it's it's it is intensive but it's it usually takes a week to ten days to complete a home and it makes you an important thing is when we do it the inspector comes into the last day and make sure it's all safe and then you're good to go now we do some that are moved in and some that aren't and tell you the honest there's much easier when people aren't living there but it's just because of furniture now you mentioned inspector inspections I get an awful lot of emails there are a lot of people in Hamilton that have had electrical work done they've never seen an inspector they've never seen any si pass so there are a lot of jobs being done in Hamilton I guess off the essays radar you want to elaborate on that all court everything you're the one doors but unfortunately as we all know when you bring in proper and professional people the cost is higher than hiring some guy off the street but if you get caught without it the fines are heavy not just for the guy that did the work but for the homeowner that hire them and the owner can get by I'm working a find quite extensively and if the if their facade forbid there's a fire if we don't have a certificate to prove they can deny your claim so you could lose everything over it's just not worth it not worth arrest and the other somesort on to the next subject is another thing that's a very popular in Hamilton is aluminum wiring unfortunately couldn't get you a sample aluminum because it stays in the walls but how we handle that instead of rewiring the house which I'm going to tell you the truth aluminum is a lot harder to rewire that there's nothing to because there was more it's done a little more proper but so we have a new way of adapting it which is accepted by insurance and the ESA now if you just have aluminum wiring you don't have to do what I'm going to say but what's important is you use aluminum rated devices this is a CO LR so I cook sorry it's a copper or aluminum rated device it has different terminals than their standard plugs and the only problem with this is they don't have them in the fancy news this Decorah style no tempura and everybody likes these these days so now what we do it is is we have a different way of handling this so we have two different types of moretz here this is our standard marette we use this for copper only which is very important a lot of people don't know that this is aluminum rated nut what this has in it is a antioxidant compound called no locks as a nickname and what it does is it prevents oxidization between copper and aluminum which is what the biggest problem with the different metals aluminum is very soft and so what happens is when use electricity it heats up and expands when it cools down it contracts and that's where it starts if you use a standard copper device like we were describing excuse me these are copper rated only now this happens too often and so what we need to start doing more is putting copper to aluminum tails which you will require an electrical inspection afterwards what insurance accepts that and it's a hell of a lot cheaper than rewiring your house that meets code I mean it's code and you're going to be a whole lot safer doing it again probably another reason why the inspection is important that's all your hands are caught those items are caught that's right it's very important okay and then our last one we're going to talk about pot lights this is our old poly with at least this is a five or six inch I'm not her sure but you know see these too often more so as you can see the size of it it is pretty tough to work with getting them into places now these get nailed to joists to help the joist and then the drywall goes up and we put the ring around it the biggest problem with this is how bulky it is and it's a very labor-intensive process to get these installs well we also have here is this is a standard retrofit pot light okay the hole would be drilled for your drywall the wire would come through this was getting installed the biggest problem with this is this can't be anywhere near floor joist there's no room for it this ball produces a ton of heat its incandescent and what happens is that you cannot have this anywhere near insulation it's a severe fire hazard okay and tell you this truth is because we when we have the drywall we don't know where the joist are we have to sometimes make mistakes and have to read drill holes as you can see not the easiest installation no not the easiest installation what's leads us to our new technology my favorite and I think Volvo speaking of these are slim pots these are I think just been on the market for the last 12 to 18 months and this ball bearing this is a built-in bulb you never change the bulb it is only half an inch thick as the customer was talking about in your email this fits directly underneath the floor joist if need be and this right here is the external wiring which is the LED driver so as Bob mentioned before energy efficiency this right here you can run six to eight for the cost of one of these Wow and for heating and cooling it makes a big difference we will show you in the show later on what this looks like installed will fire them up for it that was my line up next we're going to be installing Bob's favorite pot lights on my triple our job site on location in Canada more than 13 million volunteers contribute over 2 billion hours every year volunteers support us in everything we do and communities thrive because of it at volunteer Canada we encourage and strengthen community involvement we work with a broad range of partners to promote and support our shared vision of a vibrant Canada to learn more visit the new volunteer dot da your connection to Canada's volunteering community [Music] hello Hamilton welcome back to our electrical show as you can see we're cutting out the circle for the pot light like my Dust Bowl this baby's beautiful trust me without this I would be covered covered and white dust especially if you're doing this on a knock down ceiling or ceiling with texture so that's as easy as it is to put the pot light in obviously you want to remove any screws now we talked about this before even with the joists here the pot light's still going to fit in easily we're going to walk over the living room now we're actually going to fish some wire and install two of these for you okay John pull that's enough okay now that we have the wire fed through it's time to install our driver box that feeds the pot light we've already done the ground connection we've done the neutral connection the last one we have to do is the live connection which is the black wire so we've stripped our wire about half an inch both of them you want to keep make sure that both these wires are about the same size otherwise the verrat the wire nut doesn't sit too well so we feed them over make sure they're nice and tight you should feel them gripping each other if you don't loose and it's only going to cause you problems so what we want to do is once we've done all the connections we've double-checked them all we want to tuck these in real nice make sure she's nice and flat and we're going to do is we're going to close this cover clementa picture clamp shut and now what we're talking about in the intro is we have this wood joist here if we were doing the old-style pot lights in order to make this work we would have had to read real this because the doctor that said it's got to stay away from the joist we probably would not do some patching a nice thing about these things they fit right in so what we're going to do is once we've got this all prepped up we're just going to tuck this wire up fit this in the cavity between the drywall enjoys and all we want to do is have the remaining white piece left so this white piece at the cord that's into the other one that comes from the driver there's a little groove inside this white piece I want to match up to this one once we clip that in we're going to screw this down nice and tight so I'm going to tuck this wire I'll take your time whether you make sure you're not squeezing the wire we're going to take these two clamps here they're just springs fit them on either side we let us close together see it's this nice and flush just grabs itself let's try it out nice thing about this and we can fit these outside to buff thank you John great idea for the viewers to know these pot lights I mean when people think of pot lights that Inc their living room you know bed basement nice big rec room these can be installed they're approved for wet look damp to slightly wet location so typically there has to be a roof covering you know when you're building a roof over your backyard your soffit your overhangs on the exterior fantastic for exterior lighting and again as long as the roof has a hangover over it so always keep these lights in mind for exterior installations you can put them in with a dimmer you can have nice mood lighting for the patio or the backyard now back to the indoor application as you can see with this one it's over a textured popcorn ceiling all of the older Hamilton homes pretty well anything anything less recent in the last 20 30 years existing Hamilton homes the older ones there really wasn't any type of lighting installed in the ceilings I go into these homes all the time and there's only table lamps or floor lamps you know back then one of the outlets will even now for table lamps its wired into a wall switch so you flicked the toggle switch on the wall and you can have certain lamps turn on but with pot lights it's a really beautiful way and it's decorative you can you know limitless design opportunities and you know the potential use your magic and create varying rows just keep in mind you don't need that many they're very bright you know typically again one of these we use the same energy capacity as you know up to six or so of typical lights incandescent really important now this is a Show 10 for season three so from Bob to all of Hamilton the heartfelt thank you for following us on the show I really truly honestly hope that you had a chance to learn you know you can follow these shows for all the past three seasons triple W just as Bob calm the largest home improvement database on the net you know you can pause fast-forward rewind you can learn from our DIY episodes at your own pace now some more heartfelt thanks you know some special people at cable 14 Linda Roark of course so I started out with about seven years ago special thanks to Gail Grenland James and Stephanie for coming visiting us on these job sites and to all the hard people behind the camera and behind the scenes doing the editing and putting things together now we want to be able to interact with you as well continuously the season we've had our Facebook contest find me on Facebook very easy bob acid orion slash just ask bob post why things are not getting done or tackled on your to-do list everybody has it to do list most are not tackling it put some pictures up give me some good ideas and story lines and in the upcoming year bob may visit one of you in your home to firstly motivate you to get up and get off the couch and bring in the crew and some materials it will kick you off and one of your projects again thank you so much hamilton for tuning in this season may all your renovations be a dream come true thank you [Music]"

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"VideoID": "3008",

"Title": "Whole House Load Calculations ALL Steps All Videos. NEC Electrical Exam Prep Compilation Article 220",

"URL": "https://www.youtube.com/watch?v=-1FspZBIK2E",

"Keyword": "Electrical load calculation",

"Transcript": "hey everyone welcome back I am the electrical code coach from Electrical Exam coach.com this is lesson 2.2 in our video series and we're going to be diving into article 220 load calculations and just to clarify what we're doing we are calculating the demand on a home in order to be able to size the main breaker the wire the pipe the service and everything that goes along with it but before we can size all that we have to know what is the demand on this home and that's what we're going to be learning over the next few video lessons article 220 is broken down into five sections the first one is General requirements the second one is branch circuit load calculations the third one is feeder and service load calculations part four is optional feeder and service load calculations and part five is Farm load calculations we're going to take you through each one of these piece by piece except for Farm load calculations the odds of you ever being tested on that are very slim and if you are you'll be able to apply everything that I am going to teach you and and roll it into a farm load C in article 220 calculations we're going to be able to round up or down we're going to round up to the nearest hole number when it's 050 and above and we're going to round down and drop it when it's 0 49 or below I want to let you know though that we're only going to do it one time at the end of the calculation you're not going to be rounding up and down in between each piece or you'll definitely end up with the wrong answer so let's imagine we have the scenario of 26 amps and after we do all of our math it equals 32.5 amps well in this case we're going to round up to 33 amps now let's imagine we have a similar scenario and when we get our answer it's 31.25 well in this case it's 049 or less so we are going to round down in this scenario and that's how we're going to deal with all of our numbers in load calculations when doing article 220 load calculations we're going to be using nominal voltages Although our actual meter reading might be 1 15 or 130 for our calculations we're going to be using nominal system voltages like 120 12240 1228 it makes it a lot easier to do these calculations not having to guess or wonder what the actual voltage readings might be the first thing that we're going to learn about for our whole home load calculation is how to calculate the general lighting and receptacle loads this is going to cover all of our general lighting and general receptacles in places like bedrooms living rooms hallway everywhere that's considered a general area we've grouped all of them together and come up with a very easy way to do it now what I'm getting ready to teach you only applies to residential one two and multif family dwelling units before we go any further we need to Define and clarify what is a one two and multif family dwelling unit well a single family dwelling unit often called a one family dwelling unit is exactly like it sounds it is a single Standalone structure or classified thereof secondly is going to be a two family in our area we call it a duplex you may not use that terminology but this is two homes that are smooshed together and classified as a two- family dwelling and anything that is three or more is called a multif family dwelling unit it's very important that we understand these definitions because there's some codes that apply in certain areas than others that we have to watch out for not only in electrical but also when we get into building Mechanical plumbing and Zoning so and these are Universal across all these trades there's a single family a two family and a multif family dwelling unit the first question we have to ask is how do we calculate the general lighting load are we going to calculate it per receptical Outlet per lighting do we have to count them add it all up thankfully no they've made it very simple so we're going to calculate it at 3 watts per square foot so for all of the general lighting and all of the general receptacles all we have to do is take the square footage of the dwelling unit and multiply it by three but the code language actually uses vas so 3 watts per square foot or 3 vas per square foot but the question is what is a VA a VA is a volt amp and for all of our testing it's equivalent to a watt so it's true for us to say that 2400 vas is equivalent to 2400 Watts so for these calculations we're going to be calculating them at 3 vas per square foot when calculating our general lighting and receptical loads we will use the outside dimensions of of a building or structure so we're going to measure from the outside of the building both directions do our multiplication and that'll let us know how many square feet we have to multiply by when calculating our general Lighting in receptical vas open porches and garages are not counted in our general square foot vas we do not count garages open porches carports and spaces that are not adaptable for future use how many vas would you calculate before demand factors now let me stop right there I haven't taught you what a demand factor is yet so I'm not going to teach you how to apply it to this part of the load Cal cuz it's really the most complicated especially if you don't know what a demand factor is I'm going to teach you a little bit at a time what a demand factor is and by time we round back around to teach you how to do it you'll be a pro at it how many vas would you calculate before demand factors in a home that is, 1500 ft of living space on the main level with a 500 ft attached garage and a 500t unfinished basement that is adaptable for future use step one is find what our total square fet that we're working with so we have our 1500 General we will count it then we're going to omit the 500t of attached garage we're going to count the 500t of basement because in this question it is adaptable for future use in your testing it'll say either or and in the real world it's almost always adaptable for future use but you can work that out with your local electrical inspector so all we have to do is total all that up that gives us 2,000 ft then we take our 2,000 ft multiplied by 3 vas per square foot and we're going to select D great job how many vas would you calculate before demand factors in a home that is 2800 ft of living space on the main level with a 500t upstairs bonus room and 500 ft of open front porch first thing we're going to do is total our square feet of course we're going to count the 2800 of General but what about this bonus room business yes we will count the 500t of bonus room I want to note that the bonus room is a part of the general square foot but the question makers will put things like this in your test to throw you off then we are going to omit the open front porch we total all this up and we get 3,300 now we take our square feet multiplied by 3 vas per square foot and we're going to select C now that we've learned about our 3 vas per square foot now we have to learn about what's called our small appliance and laundry circuit vas in every whole dwelling unit calculation we're going to have two small appliance Branch circuits calculated at 1500 vas each and one laundry circuit calculated at 1500 vas each for a total of 4500 vas now this is something that we're only only going to do and attach it to the general lighting load in receptacles before demand factors we're only going to do it when we're doing a whole house load C we are not going to add it on to something like an individual dryer or an individual range those are calculated individually this is only when we're doing a whole home load C and once we start doing them I will make sure to reiterate to you so you understand when and how to apply this the easiest way to do it is anytime you're doing a whole old dwelling unit load calculation is you take your square foot and you multiply it by 3 vas per square foot let's imagine we had this 2,000t house multiplied by 3 vas equals 6,000 ft then you just tack on the 4500 it's for the two small appliance and the one laundry circuit and you're only going to tack it on if you're doing a whole home load C all right y'all that's it for lesson two you can head over to Electrical Exam coach.com to unlock the pro version and all of the quizzes and practice test let's get to it hey everyone welcome back I am the electrical code coach and this is lesson 2.3 at Electrical Exam coach.com today we're going to be learning about fixed appliances and how they work into a whole house load calculation fixed appliances include things like dishwashers in this picture but it also includes things like garbage disposals water heaters central vacuum systems and microwaves and pretty much any other Appliance once it's fixed you'll notice notice in this bottom right hand picture that there's two microwaves one is not fixed and the other one is fixed and when you fix it to the wall or fix it so it can't move either with plumbing or mechanical vents or anything else it now becomes a fixed Appliance and there's a special way that they calculate them when doing a whole home load calculation what it does not include is it does not include dryers or ranges we're actually going to deal with those separately so this includes all other fixed appliances except for drers and ranges let's get to it before we dive into the calculations let's learn about demand factors we're going to be using them for the rest of the program a demand factor is a multiplier that the code will use to decrease or increase the total calculated demand the question is will they use all four of these appliances at the same time and the answer is no so the Cod makers have made it so we can reduce the overall demand instead of just counting them watt for Wat wat they've made some multipliers that allows us to reduce the demand that we calculate and remember if we have less amps we could have a smaller service if we have smaller service we could have smaller pipe smaller wire and a smaller overall cost of the job the small appliance 75% rule works like this where four or more appliances are fixed in place you can apply a 75% demand factor to the total calculated load of the appliances I do want to note again that this excludes drers and ranges we're going to learn how to calculate those separately later in the program so let's imagine that we have these appliances and the question is how do we calculate them all together to turn it into amps and later size our service which sizes our wire and our pipe what we're going to do first is find our total connected load so we're going to go ahead and total all these up and that equals 6,800 then we're going to stop and check for demand factors step one in all load calculations is to to get the total connected load then we're going to check for demand factors and in this case we can apply the four or more 75% rule we take 6800 multipli by 75 and that gives us a new reduced load of 5100 watts and that's what we would take and add to our whole home load calculation how many vas would you calculate for a single family dwelling that has the following appliances a 4200 VA water heater a 1,000 VA disposal and an 1100 VA dishwasher first we're going to find the total connected load we total all that up it equals 6300 vas now we check for demand factors in this case we only have three appliances so the 4 75% rule does not apply and all we have to do is take our total I do want to note that one of the four choices was as if you had incorrectly applied the 75% rule in this case because we only have three we don't apply any demand Factor at all and we take the total connected load at 6,300 great job how many vas would you calculate for a single family dwelling in Dallas Texas that has the following appliances a 4200 VA main water heater a 3500 VA additional water heater for the basement a 1,000 VA disposal and an 1100 VA dishwasher first we're going to find our total connected load we take and total it up and it equals 9800 now we check for demand factors sure enough we have four or more fixed appliances so we can apply the 75% rule we take 9800 multipli by 75 that gives us a new reduced load of 7,350 vas I want to note that if you look at option b it was 9800 as if you didn't apply the 75% rule you got to be careful often times they'll have one of the answers be as if you missed or added one of the steps that you shouldn't have but you've been grinding you're going to get it I know you can do it and we're going to select C let's get to it all right y'all that's it for lesson two you can head over to Electrical Exam coach.com to unlock the pro version and all of the quizzes and practice tests hey everyone welcome back I am the electrical code coach from Electrical Exam coach.com and today we're going to be diving into drier load calculations we're going to be in section 22054 and looking at table 22054 let's head there now when we get to table 22054 we're always going to read our black bold heading to make sure we're in the right table great I feel like we are we're going to start on the left hand side and find our number of drers then we're going to use a straight edge and come over and find our demand factor in percentage I want to make an important distinction at this point in the program you have to be very careful with these titles right here sometimes they're listed in a replacement value and it just says demand and in other tables it'll say a demand factor in percentage and we've learned that that is just a multiplier section 22054 lets us know that dryers must be calculated at a 5,000 VA minimum or the name plate rating whichever is greater now let's learn what a name plate is equipment name plates a plate mounted on the equipment or engraved in the equipment that is stating its voltage amperage horsepower and or its wattage now it may only have a few of these but as we've learned in previous lessons we can apply Ms law to find the unknown now that we're dealing with larger wattage appliances we want to make something clear before we move on we remember that 1 VA is equivalent to one watt but what is a KVA in our testing it's the same as a KW which is a kilowatt which equals 1,000 Watts so it's true to say that 1 KVA is 1kw for all of our testing now let's imagine that we have a dryer and this dryer is a 5kw well it's also true to say that it's 5,000 watts and at the same time if they say that it was 5kv it's also true to say that it's 5,000 vas let's practice converting back and forth very quickly let's go from KVA to VA so if we had five KVA and we wanted to go to VA all we would have to do is take and multiply by a th000 and that would equal 5,000 vas and the same if we wanted to go from VA to KVA all we have to do is divide by a th000 and it'll convert it over to KVA you'll get very familiar with this and won't have to do any multiplying or dividing but if you ever forget that's all that you have to do what is the total VA load you would calculate for one dryer with a name plate rating of 4500 Watts first we find the total connected load for this we know that we have to do a 5,000 minimum or the name plate whichever is greater so the 4500 is gone and the 5,000 remains now we check for demand factors for this we're going to head to table 22054 and we're going to find that one through four dryers it's at 100% meaning that there is no demand factor and we just select a great job what is the total VA load you would calculate for one dryer rated at 5200 vas first we're going to find our total connected load we know that we have to do a 5,000 minimum or the name plate whichever is larger in this case the name Plate's larger so we're going to select 5200 now that we have our total connected load we're going to check for demand factors for this we head to table 22054 when we get there we find that for 1 to four dryers it's calculated at at 100% there is no demand factor and we're going to select C what is the total VA load you would calculate for one duplex with one dryer in each unit and a name plate rating of 4,800 watts per unit first thing we're going to do is we're going to find the total connected load we know that it's a 5,000 minimum or the name plate whichever is larger so the 4,800 is out and the 5,000 is in then we have to multiply by our two units and that gives us 10,000 now we check for demand factors for this we head over to table 22054 and we're going to find that 1 through four ranges is calculated at 100% and we're going to select a what is the total VA load you would calculate for an 11 apartment multif family dwelling unit with one dryer per unit and a name plate rating of 5,000 Watts first we're going to find our total connected load we know know that it's a 5,000 minimum or the name plate whichever is larger we take our 11 units multipli by 5,000 and that equals 55,000 vas now we check for demand factors we head over to table 22054 when we get there we find the demand factor for 11 is 47% so we take our original load multiplied by the demand factor and that gives us a new reduced load of 2,850 vas and we're going to select C great job what is the total VA load you would calculate for a 17 apartment multif family dwelling unit with one dryer per unit and a name plate rating of 5,000 Watts first we're going to find our total connected load we're going to use 5,000 minimum or the name plate whichever is larger we take our 17 units multiplied by 5,000 each and that gives us 85,000 vas now let's check for demand factors when we get to table 220 54 we're going to find that it's a 47% base minus 1% for each dryer past 11 so what we do is first have to figure out how many dryers we are past 11 we have 17 dryers minus the 11 base and that lets us know that we're six pass 11 well what this code is stating is that 47% was our base multiplier and then what we're going to do is minus 1% for each one that we are past 11 we were six past 11 so we're going to take our 47% base minus 6 and that's going to give us a new demand factor of 41% now all we have to do is multiply we take our original load multiplied by 041 and that gives us a new reduced load of 34850 v and we're going to select B great job that's the end of lesson 3.1 I want to encourage you and let you know that you're doing a great job and that you can do it you can head over to Electrical Exam coach.com to unlock all of the features in the pro version including flashcards and practice quizzes I want to let you know that I offer coaching 100% for free all you have to do is just email me at electrical Cod coach gmail.com let's get to it hey everyone welcome back I am the electrical code coach from Electrical Exam coach.com and this is lesson 3.2 in our video series today we're going to be learning about how to calculate ranges and cooking equipment and how they fall into the whole house load calculation we're going to be in section 220.55 we're also going to be in table 220.55 let's get to it when we get to table 220.55 we're going to read the black buold heading at the top of the table to make sure that we're in the right table then starting on the left hand side we're going to find our number of ranges 1 2 3 4 5 and so on and so forth then we're going to notice that there's three different columns they're really in two different groups it's column A and column B are grouped together under the demand factor in percentage column and the reason that's so important for us to watch out is because column A and column B are multipliers they're actual demand factors but column C is a replacement value and you'll understand more of what that means as we get further through this video starting on the left hand side in column A this is when your individual range Falls 3.4 or less kws in column B is when our ranges the individual range itself Falls in between 3.5 and 8 and 3/4 then column C is when our ranges are 8.76 through 12kw then in the bottom left hand of the table you're going to see some notes and that's when we have a situation that doesn't fit into the normal table and we're going to take it piece by piece let's get to it how many vas would you calculate for a 99kw range in a single family dwelling the first question we're going to ask is what column does our individual range fall in well ours is a 99kw so it's going to fall into column C because it's greater than 8.76 but not over 12 and column C is a replacement value now let's find our total connected load on the left hand side we're going to find our number of ranges in this case it's one then we're going to cross all the way back over to column C and find that our replacement value is 8kw then just to stay in practice I want you to always be familiar with checking for demand factors but in this case in table 220.55 column C is a replacement value it is not a multiplier so we're just going to select C great job what is the total VA load you would calculate for three 3kw ranges in a dwelling unit first question we're going to ask is what column does our individual range fall in well ours is going to fall into column A because the individual range is 3kw so we know that we're going to be doing a demand Factor now we can start from the beginning first find our total connected load we take R3 multiplied by 3kw and that equals 9 KW now we check for demand factors we're going to start on our left hand side of the table we're going to find our number of ranges then we're going to come over and we're going to find our demand factor and we find that the demand fact factor for three ranges in column A is 70% now all we have to do is multiply we take our 99kw multiplied by our demand factor that gives us our new reduced load and we're going to select B what is the total connected load you would calculate for two 3.2 KVA cooking appliances in a dwelling unit first question we're going to ask is what column does our individual range fall in our Falls in to column A now let's find our total connected load we take and multiply it out and we end up with 6.4 now let's check for demand factors when we do that we start on the left hand side of our table we come over and find our number of ranges and then we cross over and we find that for column a two ranges is 75% now all we have to do is multiply we take our 6.4 multiplied by our demand factor and this gives us our new reduced load and we're going to select a great job what is the total VA load you would calculate for one 7 KVA range in a dwelling unit first off let's find out what column we're using our individual range falls into column B now let's find our total connected load well in this case it's just one range so the total connected load is seven now let's check for demand factors when we head back to our table we're going to start on on the left hand side and find our number of ranges then we're going to cross over and find our multiplier and when we do that we find that it's 80% for one range now let's do the math we take our seven multiplied by our demand factor and that gives us our new reduced load and we select C how many vas would you calculate for a 14.6 KVA range in a dwelling unit step one find out what column our individual range Falls in when we get to column C we find out that it's only good through 12kw when it's over 12kw we have to use one of our table notes listed down below the table in this case we're going to be using Note One Note One says that when you have ranges that are 12 through 27 KVA what we're going to do is increase that column C value by 5% for each KW that we are p P 12 now that sounds really complicated but I'm going to break it down piece by piece step one is find your total connected load in this case it told us to increase the column C value by 5% so we start on the left hand side and find our number of ranges which is one and then we cross over and find the column C value which is 8 KVA it wants us to increase that number by 5% for each KW we are past 12 well we're 14.6 P 12 and what the code States is that you're going to increase it for each KW P 12 or major fraction thereof that's just a fancy way of saying if it's 0.50 or greater you're going to round up if it's 049 or less you're going to round down well in this case we're 6 so we're going to round up to 15 KVA so we are 15 and we need to find out how many we are past 12 well to do that we can do some simple math we have 15 we need to minus the 12 base and we have have three left over then we need to take that three and multiply it by 5% for each one which is a total of a 15% increase we're going to take our original number from column C and we're going to increase it by 15% and that's going to give us 9.2 KW the reason that I put the one in front of it is because that brought back the eight and we increased the eight by the 15% and it gave us 9.2 and we're going to select a great job what is the total VA load you would calculate for a 3 KVA cooktop and two 4kva wallmounted ovens in a dwelling unit first thing we're going to ask is what column do the individual ranges fall in well in this case we find that it falls into column A and B this question is very simple all you have to do is treat the column A ranges individually the column B ranges individually and then total them together so what we do is we find our total connected load the column A ranges is just one so it's 3 KVA the column B ranges we have to do some math and we end up with 8 KVA now we check for demand factors we head back to our table and we start on the left- hand side for our column A ranges and we find the multiplier for one and then we start on the left-and side and find our number of ranges for our column B ranges and find the multiplier and we're going to find that they're 80 and 65% respectively now all we have to do is do the math we take our column A ranges and do the math take our column B ranges and do the math but then we can't forget to Total them back together and we're going to select a great job hey everyone welcome back I am the electrical code coach from Electrical Exam coach.com today we're going to be calculating HVAC cvas for our heating vending and cooling the only code that we need to be familiar with is 22060 and that's talking about non-coincidental loads let me explain what I mean usually in a typical house you're not going to be running the heating and the cooling at the same time so the code has made Provisions for our whole house load Cal that we only have to count the larger of the two let's get to it how many vas would you calculate for a 18.2 amp air conditioner compressor with a 1.8 amp blower and a 10kw heat strip rated 240 on a dwelling unit first thing we're going to do is find our total connected load let's do our air conditioning first we take our 18.2 amps and then we add it with the blower motor that's going to give us 20 amps now to convert that over to vas all we have to do is multiply 20 amps multiplied by the voltage gives us 4,800 vas now let's do the heat we have 10,000 to start with but then we need to add the blower motor our blower motor is 1.8 amps multiplied by 240 that gives us another 4 432 vas and then we total the two together now we check for demand factors there are no demand factors on this and we will just select the larger of the two and in this case it's going to be the heat we select C great job how many vas would you calculate for a 28.2 amp air conditioner compressor with a 3.2 amp blower motor and a 6kw heat strip all rated to 40 on a dwelling unit first let's find our total connected load let's do our AC first we take our amperages and we add them together then we need to take and multiply that by the voltage to convert it over to watts and we end up with 7,536 now let's do our heat we know that we had 6 kW to start with then we need to add our blower motor we take our blower motor at 3.2 multiplied by the voltage and that gives us another 768 vas we total those two together and we check for demand factors there are no demand factors on this part of the code so we're just going to select the larger and in this case we're going to select the cooling great job hey everyone welcome back I am the electrical code coach from Electrical Exam coach.com and this is lesson 4.2 in our video series now we're going to learn how to apply the demand factor to the general lighting load at the beginning of the program we learned that it was 3 vas per per square foot and we had to add on the 4500 vas for our two small appliance in one laundry circuit at the beginning of the program I did not teach you about the demand factor for this CU it it's kind of complicated at face value especially if you don't know what a demand factor is but now that we're this far in the program and you are very familiar with using demand factors I'm going to teach it to you now and for this one we're going to head to table 22042 it's a very important table in our load calculation process when we get to table 22042 we always read the black bold heading to make sure that we're in the right table and it says demand factors for lighting now you can ask the question if this is the 3 vas per square foot well it includes receptacles and you are correct we are allowed to use this table for commercial lighting or any of the lighting in the following locations that we're getting ready to talk about but we're also allowed to use it for the entire 3va per square foot plus the 4500 that we t on for the two small appliance and one laundry using this table we start on the left hand side and find our location the first one we find is dwelling units then we're going to find hospitals hotels and motels warehouses and really important down here at the bottom it says all others so if it's not listed inside of this type of occupancy we're going to cross over and if you look over here down in the bottom right hand it's at 100% calculation meaning that there is no demand factor for life in unless you're one of these specific places that are listed on the left then over here across the top we find our demand factor in this column it's the portion of the vas and then in this column it is the demand factor in percentage we're going to break this down one piece at a time and learn how we apply the demand factor to the 3 vas per square foot and the 4500 vas for the small appliance and the laundry circuit let's get to it when looking at this table we're going to see a multi-layer demand factor for dwelling units step one we're going to take the first 3,000 vas at 100% step two we're going to take in between 3,1 through 120 which is technically just another 117,000 more and that's how I'm going to refer to it for the rest of the program we're going to take that percentage at 35% and then we're going to take anything above and beyond that at 25% then step three we add them back together we take the original 3,000 that we set to the side then we're going to take that new reduced load add those two together and that's going to give us our total load what is the total VA General lighting load you would calculate for a, 1600t home including the small appliance circuits and the laundry circuit in a dwelling unit and this is going to be after demand factors I do want to note that in your actual testing they will not list that there are two small appliance in one laundry circuit when you're doing a whole house load calculation or a part of a load calculation that's dealing with the general lighting load you have to know to add that 4500 VAs on there they're not going to list that there are two small appliance in one laundry circuits step one find the total connected load we know that we have 1,600 ft multiplied by 3 equals 4800 ft vas now we need to tack on 4500 for the two small appliance and laundry circuit and when we do that we end up with 9,800 now let's check for demand factors when we head to table 220 42 we're going to find that in the first step we take the first 3,000 and do what I call burning it we're going to set it to the side so we take our total vas minus 3,000 and that gives us a new reduced load of 6,300 vas now we take that remainder at35 remember it's just a multiplier after we multiply that out we end up with 2205 now we can't forget to add back the original 3,000 that we took at 100% And we end up with 52 5 and we select D great job what is the total General lighting load you would calculate for a 1200t dwelling unit notice that I took out all the pointers that we had in the previous slide anytime it asks for the total you're always going to be applying a demand Factor if there is one and in every one of these type calculations you're going to have the two small appliance and one laundry circuits step one find the total connected load we're going to take our 1200 ft multipli by 3 vas per square foot and that's going to give us 3600 ft vas now we have to tack on our 4500 for our two small appliance in one laundry circuits 3600 + 4500 equal 8100 now we check for demand factors we head to table 22042 step one we're going to minus 3000 and take it at 100% step two we're going to multiply that by. 35 all we have to do now is add them back together and we end up with a new reduced load of 4,785 vas and we select a great job hey everyone welcome back I am the electrical code coach from Electrical Exam coach.com and this is lesson 4.3 in our video series and today we're going to be tying all these pieces together that we've been learning about the whole home load calculation we're going to learn how to take our general our fixed appliances our dryer our range our HVAC and turn turn it into our whole home demand let's get to it what is the total VA demand you would calculate for a 1600 square foot home with the following loads now I know this looks daunting but we're just going to take it one piece at a time you've worked very hard up into this point and I know you can do it I want us to get used to laying out all of our calculations like this on our piece of paper write General fixed appliances dryers ranges and HVAC and we're going to fill them in one at a time step one is to find our general receptacle and lighting load we're going to first find our total connected load by taking our square foot multiplied by three vas then we need to add in the 4500 vas for the two small appliance and one laundry circuits that gives us a total of 9800 now we check for demand factors step one we're going to take the first 3,000 and set it to the side then we take that new reduced load and multiply it by. 35 now we take and add them back together together that gives us a new Total reduced load of 5205 and we add it up here to our larger calculation now let's do our fixed appliances we have a garbage disposal dishwasher and water heater find the total connected load we total them all up and it equals 5500 now we check for demand factors there are only three appliances so the four or more 75% rule does not apply and we write down 5500 now we deal with our dryer in the same way we find our total connected load we know that it's 5,000 minimum or the name plate whichever is larger now let's check for demand factors when we get to table 22054 we find that 1 through four dryers are calculated at 100% And we put down 5,000 now our range first thing we're going to ask is what column does our individual range fall in well this one falls into column C and column C is a replacement value let's find our total connected load we start on the left hand side of the table we find our number of ranges and then we cross over to column C and it's 8,000 now we check for demand factors there are no demand factors on column C because it is a replacement value and we write down 8,000 great job now for our HVAC cvas we're going to take the larger of the heating or cooling first find our total connected load our heating is 10,000 and our cooling is our amps multiplied by our volts which equals 4320 now we check for demand factors there are no demand factors on this portion so we're just going to select the larger of the two and we're going to put down 10,000 now all we have to do is total it all together now all we have to do is total all of our loads make sure that you push the equals button in between each addition and the reason is sometimes when you add a bunch of numbers without clearing it out it will mess up inside the calculator so I'm going to do mine like this 5205 plus 5500 and then I'll hit the equals button and then I'll do plus 5,000 plus 8,000 plus 10,000 pushing the equals button in between each time just to make sure I end up with the right answer then I'm always going to double check my answer on these large calculations and make sure that I get the same number twice we end up with 33705 and we select a that's the end of lesson 4.3 you can head over to Electrical Exam code .c to unlock the pro version and all of the practice tests if you need anything from me in Life or business you can always just email me at electrical Cod coach gmail.com let's get to it hey everyone welcome back I hope you guys are having a great afternoon we're here at the electrical classroom getting all the books out the codebooks the tabs and everything that we need to start a brand new in-person semester tomorrow morning at 9:00 a.m. today I wanted to take a moment and show you this we are now offering our entire video series to get your electrical license on a USB flash drive the beautiful thing about this is you won't have to watch any commercials you won't need to have internet access you can plug it right into your TV you can plug it right into your phone and I'm going to show you a live demonstration of that here in just a moment you'll also be able to plug it into your car cuz we're also going to convert them all over to MP3 that way if you just want to listen to them as you travel in the car you'll be able to do that as well it's a onetime fee of $99 it'll have all the videos plus it'll have a lot of classic older code coach videos that are great instructional videos some code change stuff some grounding and bonding things lots of different things that you're going to have on here all included in that one $99 price that price also includes shipping let's go ahead and show you what it looks like on the phone let's get to it all right y'all this is what blew me away about the whole thing so every order is going to come with an adapter for your phone you select that on the website then all you have to do is plug it in the bottom and plug the USB drive in and when you plug it in let your phone work its magic and it'll come across the top here or however your phone works and then right here you can click on it and it'll have all the videos already listed right in there for you we have the full complete program then we have tons of just questions over and over and over you pause the video try to answer it on your own and then it'll go through it and give you a full video explanation but it works like this you just click on it tell it what to play with on your device and then you'll be able to watch it whether you have internet or not and that's the beautiful thing about it so whether you have internet whether you have connectivity you don't have to watch any YouTube commercials you can watch the entire program right here on your phone computer tablet and also you can plug it in the car because it has full mp3 access all right y'all that's it for me we would love to have you guys in person but if you can't ever make it out here to Tennessee you can always check us out on video you guys know that my heart is to see you guys win so if there's anything I can do to help you in Life or business you can just email me at electrical code coach gmail.com very excited about this USB each order is free shipping and it also comes with a free phone adapter of your choice let's go ahead and get to it"

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"VideoID": "3012",

"Title": "Load Calculation for Basement Electrical",

"URL": "https://www.youtube.com/watch?v=eJBet9kofcM",

"Keyword": "Electrical load calculation",

"Transcript": "hey guys joshua peterson peterson electric it is may 1st of uh 2020 right around the eighth week of covid this video from my seo guy is going to be about kind of a load calc for basements i already did one general about it but it's going to be a little bit more in detail so when you're looking at a basement guys um first of all if you hear some of my videos look you need to read the code book okay what's taken me 22 years to understand and know is not for me for you to call up from florida and ask me a bunch of questions or alabama tennessee china i had an australia in the european and canadian animal call me up ask me a bunch of questions how to do stuff i'm not a teacher okay i was a teacher years ago but um i don't teach i just do youtube videos try to help people out mostly kids here to help electricians that's always been my goal and i have never said i'm a dyi guy i do good on youtube quite a bit ask a bunch of questions or look i don't really ask questions but i look at people's videos um so i always believe in trying to give back rather than just take so so many people like to beat me up all the time and try to be as loud as i can but i understand a few things one i'm in their home and two once the job's done roughed in i can't get back in their home and talk about it they're gonna put drywall up and i'm come back at trim and if you have to link the video together figure out trim because it took them six months to a year to figure it out and figure it out i'm not gonna be wearing the same shirt either right but if i do three four videos on an area and you catch it this shirt's the same the date's the same i've been changing that last two years i am trying to talk louder but sometimes they're upstairs and they're working and i can't talk so loud turn up your volume actually you know what's best try to get some bows turn up the volume that really seemed to help me to hear people's videos but complaining about it's not going to change anything i did take my banner down too by the way so anyways moving on for future here when you're looking at your load calc you need to look in the code article 220.42 talks about 210 210.20 there's a lot of code articles that talk about how to figure out a load calc all right very basic three volt amperes per square foot this does include unfinished area but keep in mind that's the bare minimum the issue i see with that when i bid a basement against some of these guys in northern colorado and they're bidding at three volt amperes per square foot a thousand square foot basement i might only end up with like 4.25 circuits and they put in four or five maybe you should look at five volt amperes per square foot so you're not popping the circuits all the time or maybe you should be putting in a 12 gauge wire and a 20 amp and a wall for a whole living exercise area not putting in 14 gauge put in 12 20 amp circuit um when you're figuring out you got to figure out heat light cooling power you've got to figure out um dedicated circuits what the area is going to be allowed to be bathrooms of course have there a bunch of different circuits kitchenettes kitchens wet bars and dry bars are totally different things too the code is not really specific on that it's kind of great some of it's just based on the fact of asking the customer what they're going to have in here we're going to have exercise equipment in here they want cove heaters they said they want to have a microwave ice maker and fridge and a disposal all of that's very specific no steam shower i did ask that we put in a bidet or a circuit for a bidet they want a heat fan light combo kit a light fan is fine on the circuit but a heat oh no you have to have dedicated circuit so all of a sudden this little 650 600 square foot basement is turned into 13 circuits which normally might be six not based on one circuit per hundred square foot it's not that at all i'm just saying in general it could be six to eight but this has got 13. all of it was listed and labeled i already knew before i did it pulled any wire and boxed much i already knew what my circuits were going to be and what they were serving keeping in mind my afc i versus my gfci my 15 amp versus my 20 amp my dual functions my quad that i'm putting in right here what's a quad that's a quad so when i look at all that making sure this panel is going to be big enough so i don't cut it all in and go oh my god i got to rip it out i'm too small of a panel right 12 24 circuit this guy when he roughed in the panel i wish i could show you this but there's a piece of wood right here and there's a gap but they put it where literally my panel was from this wood to this wood like we've got to come in the top and the bottom so railings on the side is perfect and will come in top and bottom but when i was figuring out my load i know my my co-heaters were 170 watts per square per linear foot i knew i had a certain amount of feet and my back circuit the code says certain amount of watts i have my mini fridge my ice maker my disposal i look those up my bath plug again i'm sorry that's a bath heater heat fan like combo kit and then i had my kitchen bar freezer bidet and then uh my square footage of 600 square foot i took it down about 13 percentage so about 8 500 watts divided by 240 35 amps divided by 60 amp 50 amp breaker i'm 59 to 79 percent on a breaker you're supposed to try to maintain around 80 to 90 percent less to you know just you don't overheat it i'm going to be totally fine so when the guy called me up uh was like uh i think you saw my other video but last week and he wanted me to wire just a sub panel slap in 125 amp had no steam shower was not growing weed was not doing bitcoin currency was not putting in a hot tub out back i'm like dude why do you need that much power it's a thousand square foot right but you're not having a second cooking unit like an oven because in northern colorado you're not allowed to have two electrical cooking ovens in most homes so if you put a little 30 amp you know skid plate or some kind of drop in cooktop yeah then you might need 60 amps if you have co-beaters you might need a hundred but it wasn't all that it's just based on the fact you thought it was a lot of square footage that's not how you do your globe calc and another customer called me up and he added all the breakers 15 plus 15 plus 20 plus 30 plus 50 plus 30 plus 50 plus 40 plus and i'm like what are you doing he goes i need 800 amps that's not how you do your load calc i know you got a 42 circuit panel by what you said but that's not how you do your load calc okay so again if you don't understand load calc and you're really not in that right brain mind of a person mechanically inclined maybe you should just hire a pro but please don't call us up from another state or country or another planet in mars and ask us how to do that stuff we're you know that doesn't have any benefit to our company but all this the fact that it's just going to be more of a liability so again if you don't understand that don't wire it if not then go to school like i did right so the point of the matter is is that this is a general idea that even in a small basement if we were to count per opening we have 70 openings in this basement where i count two per opening is going to be things like building and hanging a ceiling fan hanging a cove heater um and by the way cove eaters are bit in a little bit separate because they have to buy the unit and the unistab but most of all this can trim and everything we just count it by one per opening there's three switches in that bank there's three openings but the bottom line is when you go through all of this there are 75 openings in the 600 square foot the more rooms you have and the more choppy the more openings you have to create because look at this this is 28 inches and this is 30 inches you have to have an outlet and you have to have an outlet they'll never ever use them what are you going to use them for a vacuum it doesn't matter code says over 20 inches and it's not a hallway you have to have one so i showed you that in the other video so keep in mind when you're doing your load calc when you're figuring this stuff out um there is a lot of things on here i kind of gave you okay but i do base my basements more closer probably to five volt amperes per square foot because three is not enough 1000 square foot basement do the math four circuits i think you should need six to seven to be safe why not do some of the lighting separate why not step up the circuit so when we wire more custom for people we're not always looking for the customer looking for the best price just to bang it out and sell the house if that's what they want they should just probably call someone else whenever the highest bid and we're never the lowest bid but we're always right there in the middle of the other two guys that are good but we always like to put in a little bit extra so like this basement we're putting in some led uh if you look at my last video some nice indirect lighting show you real quick we'll do like a nice little led strip here a little led strip in that kid's nut little led strip inside here and then in this unfinished area which is not big and we put in our transformer and our switchable transformer so anyways guys if a lot of the material and the parts and the tools the tools alone if you don't have the tools i mean as you're a homeowner watching my video i respect that the dui but i got two of these you're going to need a 5 8. some guys draw a little holes and someone's doing way too big holes there's new codes on how many wires can you stick inside of a hole that's kind of a bar joke right and that one i was probably pushing it a little bit up there i got one two three four five but they they're trying to treat it this is how stupid the coat's getting just to be frank if you're watching the nec you guys are worried about oh 10 romex is in a hole because the neutrals count is current carrying and you can't have more than seven to nine or you rate your wire from seventy percent down to fifty percent but then you allow a nipple less than two inches in a panel to be stuffed 100 full that's the dumbest i've ever heard point of the matter is guys when you're drilling your holes don't put too many wires in there i try to do more than three to four if i get five near a panel i try to route a couple around most inspectors are like yeah this is a tight area but keep in mind though if you also don't know where to put your panel you're going to be in trouble make sure that's important we did put this closer we still have to go out through the garage and pipe in the garage and we'll have to transfer romex to a thwn-2 wire in a conduit out in the garage are we doing that because it's outdoor rated no no thw wire is rated for outdoors like hot tubs but if you've ever tried pulling a six three row mix through a three quarter or one inch with a bunch of bins it does not go and you can't slit it and then shove it in you're not allowed to take the jacket off either because there's no rating and they got you on 210. what was that 310.104 on that it's getting so picky it's like really there's some common sense to create not create a fire and there's common sense to do something stupid but the bottom line is that you know when you're pulling in romex you want to make sure it goes smooth i mean guys that come in and go through their 90 degree hole and then staple it right on the side you will be tripping your arc fault you don't know what you're doing these arc faults are so sensitive you can't do that in fact i use a lot more stacks i don't even care how much they cost i just don't want my stuff hit so stuff like this this garbage disposal in case the plumber's in my way i can figure out how to cut that bracket out with a sawzall pull it off pull out this stack i met code within 12 inches but it's loose it's tight but then i don't have my plumber coming in here or someone hitting it so there's times that i'll just staple it tight you know really tight because i know this is my shower and he's going to be putting in a shelf for his shampoo if you do that back to back to kitchenette your plumber loves you because it's cheaper right but putting the two by six wall back to back that way everybody can get their crap inside especially vent stacks but nowadays plumbers they're getting a little lazy they get all this pex pipe and they do those little stack vents out they don't have to go outside anymore with that stuff that's amazing their trade got easier mine got harder anyways um guys yeah so if you're considering doing your own basement when you're done with the basement guess what about a thousand foot roll i'll be using this for a couple basements so the tools are really important um but you might be just better off hiring it out if you're kind of on that teeter-totter fence you know i've bought in tools to do my roof and i didn't think i'd use them again but i did do a shed so i did have to put on the same stuff and use my same gun to put on my material for my shed so there are some benefits painting i thought oh use my painter one time on the outside of my house i ended up later spray painting oh and a spray painting um excuse me uh spraying my cabinet doors so i was able to do that in the garage in the winter like two years later and i was like oh good so all of a sudden those tools i bought they kind of like yeah i'm using them more but if you're not going to sure you're ever going to do that again don't do it just hire a person out but if you're going to hire it out look at the things that i've told you some of these ideas they might help you out so you don't end up tripping circuits later be in mind that your inspector is not looking at where your circuits go and how much they should support if you decide to come down there in a brand new basement and put in a nordictrack running and you're exercising down there and you have the same circuit and your husband wants to jog with you trip over and opacity uh even on a 15 up circuit some can trip them as they ramp up um but yeah so the only other thing i'm going to mention is that if you're going to decide to ever do like a a beer um uh brewing i've wired in last one i did last year was 70 amps on brewing you would need 125 amp circuit and the most you can stab on a breaker outside is 125 amps thanks guys for joining us sorry it was a little bit long hopefully some good tidbits for you take care"

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{

"VideoID": "3038",

"Title": "ELECTRICAL LOAD CALCULATION OF DOMESTIC LOAD",

"URL": "https://www.youtube.com/watch?v=kYLtnPxj8io",

"Keyword": "Electrical load calculation",

"Transcript": "foreign simply so foreign you"

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"VideoID": "3047",

"Title": "Three Phase Electricity Basics and Calculations electrical engineering",

"URL": "https://www.youtube.com/watch?v=qthuFLNSrlg",

"Keyword": "Electrical load calculation",

"Transcript": "Hey there, guys. Paul here from TheEngineeringMindset.com. In this video, we're\ngoing to be learning more about three phase electricity. We'll cover how three\nphases are generated, how we get two voltages\nfrom a three phase system, what do cycle and hertz mean, where the sine wave comes from, and how to calculate the voltages. Now, we use the power sockets to power our electrical devices. The voltage from these\nplugs varies depending on where in the world we are. For example, North America uses 120 volts, Europe uses 220 volts, Australia\nand India uses 230 volts, and the UK uses 240 volts. This is the standard voltage set by each country's government regulations. You can look this up online\nor we can just measure it at home if we have the right tools. I'm in the UK and I can read the voltage with my energy monitor. In this case, it reads about 234 volts. It's lower because there\nare some losses in the wire but also the voltage\nvaries throughout the day. Alternatively, I could\nalso use a multimeter to take a measurement of this. I can put the probes into the socket and take a reading of 236.8 volts. The readings are slightly different because the multimeter is more accurate. You should be electrically competent and qualified to do this. Remember, electricity is\ndangerous and it can kill you. If you don't have an energy\nmeter or a multimeter, these are very cheap, very useful. So, I do recommend you get one and I'll leave a link in\nthe video description below for where you can pick\none up online for cheap. As I said, the voltages at our sockets do vary throughout the day. You can see here, I've\nlogged the average voltage every five minutes for 24 hours and it varied between 235 and 241 volts. Now these voltages at the\nsockets are single phase from a wire connection from either a generator or a transformer. They come from connecting\nbetween a single phase and a neutral line or in other words, just one coil of the generator. But we can also connect to\ntwo or three phases at once. So two or three coils of the generator. This is typical in large\nproperties, with large equipment and large appliances\nwhich need more power. In North America, you often\nfind two phase supplies in homes with 120 or 240 volts. That is a completely different system and we'll cover that in a separate video. This video is only for three phase. Looking at the different\nvoltages, in the US we get 120 volts from a single phase or\n208 volts from three phases. Europe, we get 220 volts single phase, or 380 volts three phase. Australia and India you\nget 230 volts single phase or 400 volts three phase, and in UK we get 240 volts single phase or 415 three phase. Again, these voltages vary\nslightly throughout the day and it's unlikely that they\nwill be exactly this value. We can measure the voltages in\nthe three phase supply also. You see here, I have a three phase supply going into this breaker. If I use this clamp meter\nto measure between phase one and two, I get a reading of 408 volts. If I connect across phase\none and phase three, I get almost the same\nreading of 410 volts. So, I'm reading across these two phases to get these readings. You can measure between\nany two of the three phases and get the same results. If I use this multimeter\nwith an inbuilt oscilloscope, and connect the terminals to\na single phase and neutral, you see I get a single sine wave. All three phases are producing a sine wave just at a different time. We can see this if I\nconnect my power analyzer to the three phase system. Here, I connect to all three\nphases and you see it produces these three separate sine\nwaves, all one after another. Hopefully, you can see\nthat the yellow phase is a little hard to make out. So what's happening here? Why do we get different voltages and what do these sine waves mean? So just to recap, we\nget useful electricity when lots of electrons move along a cable in the same direction. We use copper wires because\neach of the billions of atoms inside of the copper\nmaterial have a loosely-bound electron in their outer most shell. This loosely-bound electron\nis free to move between other copper atoms and they\ndo actually move all the time, but in random directions,\nwhich is of no use to us. So, to make them move\nin the same direction, we move a magnet past the copper wire. The magnetic field\ncauses the free electrons to move in the same direction. If we wrap the copper wire into a coil, we can fit more copper atoms\ninto the magnetic field and we can therefore move more electrons. This gives us an alternating current. Instead of someone moving a\nmagnet back and forth all day, engineers instead just\nrotate it and then place a coil of copper wire around the outside. We split the coil into two\nbut keep them connected and then place one at the\ntop and one at the bottom to cover the magnetic field. When the generator starts,\nthe North and South pole of the magnet are directly\nbetween the coils, so the coil doesn't experience any\neffect and no electrons move. As we slowly rotate the\nmagnet, the North side passes the top coil and this pushes\nthe electrons forward. So we get positive values. The strength of the magnetic\nfield increases as it rotates up to its maximum, whether\nmost electrons are flowing. The magnetic field then starts to decrease and less electrons flow\nuntil the magnet is again directly between the two coils. Then the South pole rotates in, but this time it pulls\nthe electrons backwards. So we get negative values. This again increases in\nstrength up to its maximum and then decreases back\nto zero where the magnet is between the two coils. If we plot these values,\nthen we get a sine wave. The North side pushes\nthe electrons forward and as the strength of the\nmagnetic field increases, more electrons flow up to a maximum point. Then we're leaving the\nNorth magnetic fields, so the number of electrons\ndecreases down to zero. Then the South pole pulls\nelectrons backwards, so we get the negative\nvalues out to a maximum and then back to zero. This one circuit gives\nus a single phase supply. If we added a second coil\nset 120 degrees rotation from the first, then\nwe get a second phase. This coil experiences the\nchange in magnetic field at different times compared\nto the first phase, so its wave form will be the\nsame but it will be delayed. The second phase wave form doesn't start until the magnet rotates\nto 120 degrees rotation. If we then add a third\ncoil, 240 degrees rotation from the first one, then\nwe get a third phase. Again, this coil will\nexperience the change in magnetic field at a different\ntime to the upper two. So, this wave will be equal\nto the others except it will be further delayed and we'll\nstart at 240 degrees rotation. When the magnet rotates\nmultiple times it eventually just forms an unbroken three phase supply with these three waveforms. With this design, we need six cables, but we can join them together\nin either a delta or Y method. For this example, I'm going\nto use a Y or star method because I think it's easier to understand. With a star configuration,\nwe need just four cables. One for each of the three\nphases and then a neutral. Sometimes you don't need a neutral, but we'll look at that in our next video. When the magnet completes\none full rotation, the electrons will have\nmoved all the way forwards and then all the way back\nto their original position. We call this a cycle. We measure cycles in\nthe unit of hertz or HZ. If you look on your electrical devices, you'll see either 50 Hertz or 60 Hertz. That's the manufacturer\ntelling you what type of supply the equipment needs to be connected to. Some devices are able to\nbe connected to either, like this charger. Each country uses either\n50 Hertz or 60 Hertz. North America, some of South America and a couple of other\ncountries that use 60 hertz. The rest of the world uses 50 Hertz. 50 Hertz means the magnet\ncompletes 50 rotations per second. 60 Hertz means the magnet\ncomplete 60 rotations per second. If the magnet makes a full\nrotation 50 times per second, which is 50 Hertz, then\nthe coil in the generator experiences a change in\npolarity of the magnetic field 100 times per second, so\nthe voltage changes between a positive value and a negative\nvalue 100 times a second. If it's 60 Hertz, then\nthe voltage will change 120 times per second. As voltage pushes electrons\nto create electrical current then the electrons change direction either 100 or 120 times per second. We can calculate how long it\ntakes for a single rotation to complete using the formula\nT time equals one divided by F for frequency. A 50 hertz frequency supply\ntherefore takes 0.02 seconds or 20 milliseconds to complete. A 60 hertz supply takes 0.0167\nseconds or 16.7 milliseconds. Now we saw earlier that the voltages from your plug sockets are\ndifferent all around the world. These voltages are known as the RMS value or the root means squared value. We're going to calculate that\na little later in this video, but the voltage coming\nout of the plug socket is not constantly 120 or 220\nor 230 or even 240 volts. We've seen from the sine wave\nthat is constantly changing between positive and negative peaks. The peaks are actually much higher. For example, in the US, the voltage at the socket can reach 170 volts. Europe reaches 311 volts, India and Australia reaches 325 volts and the UK reaches 339 volts. We can calculate this\npeak or maximum voltage using the formula, VRMS multiplied by the square root of two. I've already worked these\nout for you on screen now. Because the sine wave passes\nthrough the same points in both a positive and then\nthe negative 1/2 of the cycle, we get the same instantaneous\nvoltages along the cycle, but they are either positive or negative. If we add these all together\nthen we would get zero volts. So we need another way to calculate this. Luckily for us, some\nintelligent person came up with the idea of using the RMS value. Basically they worked out how much heat an electrical heater could\nproduce when connected to an AC, alternating current circuit and then they connected it to\na DC, direct current circuit and increased the\nvoltage until it produced the same amount of heat. They then worked out a formula we can use. That being the square root of the squared average instantaneous voltage. I've just calculated what\nthat would be for the wave on screen now and you can\nsee that the sine wave with 170 volt peaks comes out to 120 volt RMS, which is what we get at the plug socket. So now we've seen how to\ncalculate the basic VRMs. Now, let's slowly rotate the generator and calculate the voltages, which cause the sine wave\nfor each of the three phases. Let's first divide the\nrotation up into segments 30 degrees apart, giving us 12 segments. We will cover the\ninstantaneous voltage at each of these rotation points for\neach of the three phases. Now I'm using Excel to calculate these and if you want a copy of my Excel sheet with all the calculations\nin, then I'll leave some download links in the\nvideo description below. For the video worked example\nI'm going to use 120 volts VRMs The sheet will update itself, plot the phase wave forms and\ngive you the calculations. Again, links down below for that. So we first write out a table\nshowing each of the segments and then the angle of rotation in degrees. First we need to convert each segment from degrees into radians. We do that by using the\nformula radians equals degrees multiply by PI divided by 180. so we calculate the radian\nvalue for each segment and fill in the chart. Now we want to calculate\nthe instantaneous voltage at each of these 30 degrees segments. We calculate the instantaneous\nvoltage at each segment using the formula V max,\nmultiply by sin, angular radians. As I said, for this example,\nwe'll be using 120 volts RMS and as we calculated earlier, that gives us a Vmax of 170 volts. So just complete that\ncalculation for each segment until the table is complete\nfor one full cycle. Now if we plot this,\nthen we get a sine wave showing the voltage at each\npoint during the rotation. You can see now how the voltages increases with the rotation of the\nmagnet and when the polarity of the magnet changes, the\nvoltages become negative. Now we can calculate phase two voltages and we can do that using the formula Vmax multiplied by sin\nangular radians minus 120 times PI divided by 180. This end part 120 times PI divide 180 just takes into account\nthe delay because the coil is 120 degrees from the first one and then it converts this to radians. So just complete that\ncalculation for each segment until the table is complete\nfor one full cycle. We can now plot this to see\nthe waveform for phase one and two and how these\nvoltages are changing. For phase three, we need to\nuse the formula Vmax multiply by sin, angular radians minus\n240 times PI divided by 180. So, just complete that\ncalculation for each segment until the table is complete\nfor one full cycle. We can now plot this to see\nthe wave form for phases one, two and three and how the\nvoltages are changing. So this is our three phase\nsupply showing the voltage for each phase, every 30 degrees\nrotation of the generator. If we try to add these\nvoltages together, we get zero because they cancel each other out. So instead we're going to take\nthe RMS voltage per phase. I'll just show you this for one phase, but the process is the same\nfor phase two and three. So, we start by first squaring\neach instantaneous voltage for a full rotation. Now take the average of\nthese values, add them all together and divide by\nhow many segments you have. In this case, we have 12 segments. Do not include the value at 360 degrees because this is a full rotation. So 360 degrees is back\nto start, which is zero. If you include this, you'll be counting the zero value twice. And your calculation will be higher. Now we take the square\nroot of that number. This gives us our RMS\nvoltage of 120 volts. This is the phase voltage. That means if we connect\na device between any phase and the neutral line, then\nwe get the VRMs of 120 volts. We can do the same for\nphases two and three and we'll get the same value. To get more power, we can\nconnect to all three phases. We calculate the supply\nvoltage by squaring each of the instantaneous\nvoltages on all three phases. We then find the average\nfor each phase individually, and then we add these\nthree averages together. Then we take the square\nroot of that number. You'll see the three phase\nvoltages comes out to 208 volts. We call the smaller\nvoltage our phase voltage, and we get that by\nconnecting between any phase and the neutral line. We call the larger voltage\nour line to line voltage, and we get that by connecting\nbetween any two phases. That's how we get more\npower from the supply. Okay, that's it for this video, but if you want to continue your learning, then check out one of\nthese videos onscreen now and I'll catch you there\nfor the next lesson. Don't forget to follow\nus on Facebook, Twitter, Instagram and of course\nThe EngineeringMindset.com."

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"VideoID": "3074",

"Title": "Electrical Load Calculation Mobile Homes, RV &amp;BoatYards 10 12 12",

"URL": "https://www.youtube.com/watch?v=5g9KnBgND1A",

"Keyword": "Electrical load calculation",

"Transcript": "[Music] out and um what I'm going to do with you is a few part of this class guys as you know you have three classes with me one is Theory we go through the electrical wiring commercial one is Kelk and lighting so we're I'm going to be hitting you with a couple of this is the last presentation about calp as a load calculation next week we will do Transformer calculation and then a week after we hit uh the lighting we start doing lighting so this will be the last presentation about load calculation in terms of uh different part different uh locations like commercial building and welders like we did yesterday I picked a few places for your mobile and manufactured homes Park so everybody has the hand outs right in the front of you okay so here's what I uh here's what this is and could you please go to um if this the article that talks about this is 550 so five 5 this is the article that talks about um about mobile SL manufactured home part so in this location guys they have a part you look at this one um here's what's given what's given is a 50 Lots where uh manufacturer SL mobile home can park pull in um permanently get sit there and get wired and your job Joe my friend is to wire the the power distribution system for these 50 Lots could that happen in real life all the time right so does everybody understand what the situation is I have 50 lots and the voltage system is 24120 single fers they're they're dwellings right they're manufactured homes dwellings uh they're single pins yeah does it does it even like a single phas now it's almost single pH this single pairs so I have 50 Lots voltage is 2401 120 single Pairs and I need to find the size equipment size service equipment for the whole 50 Lots everybody understand that one so we're going to put the whole 50 Lots we have to have a distribution system that feed a disconnect typically because they have a they have a disconnect with a meter for each one of these manufactured homes uh within sight of manufactured homes and you feed them with 60 to 100 amp um feed either plugged in or hardwired right so we're not interested in the in how to feed the actual manufacturer homes we're interested in the distribution system okay so right in here right in this part of the lot I have my mean distribution panel and I'm bringing the power into it that's what I'm interested main distribution panel bringing the the the power into it and going and feeding each and every one of these Lots each and every one of these Lots I don't know it will make it too complicated here but you can get the point right you're coming from this and you're feeding all these here and here and then you keep going for each one of these Lots um and all the way I made come okay does everybody understand they coming from the distribution panel feeding all these U these Lots 50 of them any question about what the given is so what's your job and mine is to come to the main distribution panel size it size the Feer that comes to it cool any question guys before before we go ahead about the what's given that's your 50 um Okay so 50 Lots everybody understand 50 manufactured homes you can stick in there okay okay what's my job my job is this is my main distribution panel the one that me distribution panel the one that we were just talking about like we have done before Brian my friend we need to size the bus the actual panel the overc fiction device the service that's coming into that panel the main bonding jumper and the grounding Electro conductor this is typical for every building that you guys going to enter Did you get the rhythm of what we do if you guys get this picture I'm going to beat this one trillion times as we move on to the industrial project that's it you get into a building and we size these things right Jeff if I if you can get all these five things about a panel would you be able to go install it guys put it together yeah size it estimate it okay so let's go ahead and do that okay so so the first thing we need to do is um we have from article um five if you guys go to Five .31 if you guys go to 55051 I'm going to go SL make a a snapshot at that boy just because we have not been there and just because Brian is my friend okay and 550 if you guys go to 550 uh 5 5 5 okay my okay 550 and 5531 right is 12 550 there's a few things here guys I'm not going to get into the details of the code requirement for it I'm want to go into the load calculation 55331 here you go right in here okay here's what I would like you to highlight right in this location please highlight the allowable demand Factor the manufactured homes are so we typically we use that that value cool typically we use that value because everybody understand when we got this value from 16k so every lot it's going to be allocated 16 KV KV by the way Adam my friend your house and I and my house are allocated by Excel Energy when they do the calculation they give us thingk 10K VA or 10K W so 16k w is not something to sneeze on for a manufactured home or mobile home so on average a house a typical house a demand is 10K so that's nothing to sneeze on okay now because now remember we are so 16 everybody knows where the 16 came from who then if you put multiple of them on a service or a feeder exactly what we did we have 50 of them on a service or a feeder 50 you can derate them so so I have how many do I have I have 50 so I'm right in here everybody can see where I am right here 50 what's my dating factor I want to remind you this is a demand Factor demand factor of uh 23% 23% what does that mean means these 50s you multiply 50 times 16k and then you multip cut it down by 23% why would they cut it down by three 23% because there 50 if they were other than 50 can you guys see how to use this demand factor for example if if there's only five of them what's your demand Factor yeah 33 39 33 no 39 off by one so you got the you got the handang of it right how to use this table exactly like any other direct table can I have thumbs up Chad we we understand where the information is coming from so let me just grab a snapshot so we don't forget it um on that boy here okay so then we we move into our topic so that's uh that's at least we know where it came from right okay so now let's go so here's where it came from um now I'm going to go back and uh okay where am I going too fast there you go so I'm going to go back and do my calculation so uh let's use which color let's use red so I have 16 k v and a everybody knows where the 16 KV came to be right how many units do I have 50 units everybody knows where the 50 came to be because I have 50 Lots cool so 50 and so if you multiply 6 16 K by 50 you end up with 80 0 k v n a KV here anybody disagree with Chad anybody disagree right this the simple math 50 of them multiply the 16 KVA where the 16 KVA from the code we just looked at that okay so that's the first thing you need to do then um then what you need to do my friends is for 50 Lots the deating factor from table 550. 31 right uh for 50 Lots what's the rating factor it's 23% right 23% let's see okay so that's your 23% then for then what you do because you have to Der now you take the 23 which is 23% you multiply it by 800 k and that will get you a healthy um 184 KV thank you so that's my demanded my demanded rate demanded rate or demand rate after you derate it right that's the most important load that you're going to use here here's my question for caring my friend look how we went from 800 KVA into down to what 184 can you can you can see that it's unreal if you want to size for 800 KV can you imagine what size of a panel you're going to come up with so imagine we went from 100 amp into 23 amp almost percentage wise okay so the rest is history then because we don't size panels based on KVA we size it based on what M so I need to go find the m so here's my I equal what's the m equal 184 don't forget the K divided by 2 40 why 2 40 because my voltage system is what 24 right 240 and when you equal when you do the math on this anybody did the math 76 7 m 767 M now we now we know what size of a panel we can have any question guys about this any question now you can go and size the feeder and the service for this panel okay I'm going to go next okay we got this right let's go this one okay so then when uh since we know that we have seven 767 amps to to size the panel where do I go again the W and 3-12 3-3 this time 3-3 because if you go higher than 600m it flip you to the switch board design anybody 800 800 so I have an 800m switchboard or pan board 800 like uh when Todd was here guys he said they make panel board up to 1200 amps after that this way they move it to switch gears what's a panel board you can throw the sucker against the wall what's a switch board or a switch gear that one is Standalone you can put it right where Jeff is sitting right in the middle of the of of the building if you the room or you can throw it against the board the wall stand alone it has own own structure you don't have to mount it against the wall so that will be a p board it 00 M same same token you take your 767 M take this one for over everybody knows what ocpd by now over device 24 24.6 and I think we have 700 or we we have to jump no we we going to go to the next standard what's the next standard 800 m 800m i comments any question see how it repeat itself this the way we're doing here now we need to find the service conductors 800 M I don't know about you guys but 800 m is is a lot to carry with one conductor anybody knows what the carut off is remember what I told you the cut off when you start you have to parallel 400 400 it makes a lot of sense to parallel after you go higher than 400 Are we more than 400 yep parallel Okay so so how many sets how many sets now when you want to think how many sets think how many 400s can I get out of the 800 always think of this so two right can I parallel three yeah you can if you want to the more you parallel the more expensive the job is going to be and the more likelihood that you can overload one set so take 800 divide it by two your goal Jeff is always when you pedal to get close to a 400 amp so 4 400 and from there did they do it this way from there you're going to go to 31.5 B16 75° column table and from here my friends you're going to get yourself a healthy a healthy um two sets this is how WR two sets of of now remember it's a single phas it's a single phase so how many conductor three conductors but but before we do the three conductors I want you guys to look at U Are we more than 200 amps does it make sense remember where I told you neutral derating the neutral does it make sense to derate if you go higher than 225 a.m always up to 225 a.m. 250 panels guys okay full new NE higher than that always do it the neutral you don't need to fall neutral by that time the the the load will balance itself okay so that's why I want to have I'm going to say two I'm only interested in the hots now two sets of number 600 600 KCM t h HW and I'm sure Jeff is saying CH I have seen switchboards 800 a and they have two sets of 500 they have two sets of 500 absolutely because if you guys remember up to 800 a the code allows you to go the conductors can be slightly amp wise less than the overc comption device so if you take two sets of 500 each one each set will give you three 380 380 \* 380 7 60 what's the next over comption device 800 so could I have gone with with two sets of 500 here yes a lot of contractors do now we're Engineers we don't pay for for the copper or the aluminum we size based on over competion device period cool but I want you to be aware there in my friend when you go and you you see them they didn't do anything wrong up to 800 amp your conductors can be slightly less am than your overcut device higher than six higher than 800 M you got to match or go higher the conductor and bity must match the overation device or more if you go over 800 okay any question about this guys why didn't I put a full neutral here you'll be a fool to pull a full neutral it's a lot of money to pull full neutral at this amps let's go direct the neutral that's why the next thing we're going to go direct the neutral so this is the service HS the two hearts cool okay the two hearts then then you go to the neutral even this look like an neutral neutral neutral what I do for the neutral guys I go based on you can go directly based on the code on the load you go directly based on the load right that you have so what's my load my load is 763 amp right so the code says there's the rating factor I don't know if you guys remember 220 61 B2 if you go to 22061 B2 it tells you anything higher than 600 anything higher than 200 D you can cut it by 70% you guys remember that rule on the neutral any am higher than 200 amp you can cut it you can cut it by um by 70% toen so let's applying this rule let's see where we are when to apply this rule so the first 200 what do you do with them don't mess with them if you when you take then subtract 200 D and that's a full low dam7 did did anybody put three here 767 thank you 767 y absolutely so then 767 here 767 subtract it from a 20 and multiply by what's the rating Factor based on this Rule and then what do you do add anybody 5 97 thank you 5 97 any question guys about this 597 now could I have used the 800 amp here size based on 800 up but we size best on the load right away okay so moving on then I am faced with 597 7 mamp I need do I have do I have a choice can I parallel or not parallel here do I have a choice now remember what we did with the phase with the hots we already parall if you parall the hots what do you need to do the neutral you have to parel them so you really have no choice I paral the hot sto then I have I have to paril the neutral with what two so when you paril them with two you end up with two n and another nine if I did my math right cool 299 then the last step my friends is you take your 299 and take them to table 3105 B and 16 under 75 Dee column um any suggestion I'm going to write it here I'm going to say two sets of remember there are two sets of number one conductor it's a neutral a WG t h h w what size 350 350 350 KCM K CN M KCM any question guys so we end up with two conductor six 00 and one conductor 350 two sets two sets any comments any questions guys does it make sense no I hope it start you start getting the rhythm of it how that system work from a commercial building into welders now into Mobile Homes we're going to get into Industrial buildings all the same a panel a feeder or a service an overation device a neutral if it's higher than 225 or 220 it's higher anything higher than 200 probably you can um cut it main bonding jumper okay can I move to the next yes no okay grounding electrode conductor for grounding electrc conductor when you parallel and my friend when you parel first of all we have 600 K CN M multiplied by if you parallel then you have to multiply by the number of sets that you parallel in every phase or in every heart how many sets did we par two so that will give me 1200 K CN right that's step number one if you par you no you place it on the phases 600 was the phase well yeah the neutral 350 yeah based on the phases or the HS not the neutal good point the phes okay then you take this mes 1200 K C and M you take this one to table 250.66 and I believe you need to take one three a w g t h h w let's just say t h HW or you can have this one also bear or bear what do you mean two two yeah you can you can run five three if you want want to should you no can you yes you can you know can I run if if I need a conductor of 14 can I put number 10 yes good luck in the other end it might not be able to land it the code doesn't care but yeah you got to be careful if you go too big on the conductors you you can't land it on the logs because what when they have a log that you need to land they have a rating the lowest and the the highest conductor that you can land on this log if you exceed that typically they are generous in giving you a really big range but if you exceed it you can't land it for example number four cannot land on the recepticle lawn even if you want to the creative people like Darren what do they do because it's stranded they chop a couple of strands out of it and they leave one and they just stick it in there oops anybody have done that when the log does does not match the cable and you're trying to force that sucker under that little log give it a haircut just give it a haircut is that what you call it haircut now that's not good though youut you haircut you basically here's a conductor that four out now you made it one out yeah thank you you stuck it under the log but it becames one out because you gave you a haircut I like the haircut is that what you the term haircut a hairc give it a haircut hey uh haircut I like that I like the haircut I like the term okay so any question about this let's go to the main main Bunning jumper for the main Bunning jumper uh whom am I going to pick on Adam you're going to go to 25028 First and 250.66 if you go to 25028 it tells you if you exceeded the 1100 KCM copper you need to do 12 half% that's basically in in 250 18 so we I do the same thing I have 2 ultip by 600 KCM you end up with 1200 KCM right now this is where my going to do my check as 1200 cas c m more than 1100 K cm is it yes if your answer is yes then you're going to go to step number three if your answer is no you're going to go to the table 250 66 right my answer is yes right is it yes then what do you do you can go the last step which is a 12.5% multili 122% multipli by 1200 KCM everybody knows how to make 122% as a decimal right and that will get you 150 K CNM 150 km 250 at 28 250. 28 that's where where this number is coming guys everybody knows where 12 and half% came from and you only use the 12 and half% if the answer to that second statement here is yes if it's not if it's not you go directly like we did here you go directly 250 that's 66 cool mistake number one that people do here they don't multiply by the number of runs that you paring so you get screwed up mistake number two they don't apply that 12% if they are more than 1100 KCM 150 KCM you have three options because 150 KCM is not a standard option number one go to the bar drink and and get upset and drink it out basically option number two is this good option for somebody so be mad at the world because they don't make one 50 KCM option number two custom design yourself you you you you sell one of your arms and one of somebody's leg and you get you 150 KCM the custom designer wire for you believe me manufacturers are n famous doing that option number three is what you're going to do next which is mostly all of us you're going to take the 150 KCM you're going to take this one guys into table chapter number nine table number eight you guys remember that table in that chapter we've been in it and yep you're going to go to table it and find the next higher not the next lower the next higher the next higher is two out or three out are you sure 150 150 three out I have three out maybe I made a mistake so when you go there you're going to add one conductor three out is WG t h HW or or uh be cool Co I'm why am I doing it oh I have the table right there CH I already have the table okay so my table is right here is 150 KCM go to there that will get you one conductor re a w and g t h HW or there huh yeah up to four ODS it's AWG higher than four ODS it becomes km that's all right if you say cas M then you have to go find what the KCM for 3at which is not commonly understandable any question guys for this okay so let's go right uh so we have I have my here's my here's how we paril them everybody can see when we paril I have two sets of conduits cool and I have my uh I have one conductor here as number uh 350 KCM t h HW and also I have two conductors number 600 KCM T HW no neutral where's the ground no ground this is just for the service when you bring the service there is only Hots and neutrals there is no ground the equipment round conductor 3 does not get into that conduit in any way sh or form that's Standalone wire that's going to the ground rod or to the steel of the building or both cool so what they do guys at this end which color I have they tie these two HS together that's what pering is and at this end they tie these two together and also they tie the neutral together can see that and the same thing at this end that's what these will be tied together and these will be tied together and I'm I'm intentionally trying to be boring here and do the graphic because I wanted to stick in your mind what pering is that's how we do it they're tied can you guys see it they're two different conduits but they're tied together at the end how they don't tie him they they land them under a two log terminal a log that has one Terminal Two terminal they take one Fair one hot one from here hot one from here time under two log terminal does that make sense what paring means here's the mistake number one jimy that uh that people get confused is the neutral and the are the neutral and the phase paralleled but the the neutral conductor and the hot conductor are they paralleled the neutral conductor and the hot conductor are they paralleled no you know what you're paralleling a neutral conductor hot conductor meaning you take the neutral from one end tie to the hot that's a dead short and you go from the other end the the the neutral tie again to the other end of the hot is this what we're doing no you only parallel hot one all the conductors of hot one with hot together all the conductors of hot two together and all the conductors of the neutral together you can't believe how many people get confused if you guys get this one as we move it to the commercial it will be very industrial it will be very easy for you any question guys about this any question conduit it size conduit it size let's go size the conduit with the the calculator that carries calculator is not working so let's do a calcul size on that that's a good exercise for that um grab your Cel and let's see if we can come up with the same size here okay wouldn't you n because you know you you have I almost default you your default is almost PVC schedu area okay all right so let's go ahead and um and try um I'm going to put my calculator in three phase you really don't have to do that so I have 3 face 75 CU copper everybody's okay with that uh this is single phase you're right so let's go sit you're right they set single phase I set it at single phase 75 copper cool it really doesn't matter we're not sizing amps here okay so let's go do the following first let's go to the phase conductors how many Let's uh the pH the hot conductors are 600 6 0 0 everybody's with me 6 0 and then do you see where it says K here hit K now this is 6006 K is 600 KCM and then H wire so that you get yourself 600 KCM copper cool thumbs up Chad okay next is the number of conductors how many of these 600 do I have two then you're going to hit the two when you're done with the two what type of insulation what type of in insulation I want to use this insulation th w/ thn so hit the insulation once hit the insulation twice that's the key hit the insulation once hit the insulation twice everybody did that get the answer here okay don't take any other buttons you got that hold your horses now let's go let's go put the second conductor what's the second conductor but make sure you hit it twice okay let's say what's the second conductor again 350 so I have three five 0 is it K yep hit the K here's a k wire size so 350 K kilo and then everybody did that we put kilo and then hit wire size now you have told the calculator that you need 350 KCM copper how many of them though how many one so I'm going to go ah hit the baby one and then what type of installation thh W and hit that again twice okay that's a cross-sectional area for it now when you're done with this go to the conduit let's hit the conduit here's my conduit it's a 3in EMT but I don't want the EMT so what do you need to do set and change set and change keep set and change set and change until you get uh there's another way a better way of doing it but uh okay where are we here uh which one so keep sitting and change we're going to go to PVC Schedule 80 is rigid no rigid I don't like it okay so keep going all the way until you hit P VC schedule 80 everybody can see it did you guys get three 3 in I don't know why I got three and a half here you got three and a half yeah everybody got three somebody got three somebody got three and a half yeah I have I have three and a half that should be three and A2 use you guys got three and a half everybody got got three okay we we would to 600 KCM huh I wonder I have three and a half on my sheet too so I'm going to put three and a half and we'll check on that one so that conduit is going to be 3.5 in anybody volunteer to do it by hand for us three and a half we'll check on that one okay so next five minutes and I'm going to give you guys recreational vehicle should we have five minutes thank you uh could you please do me a favor change the conduit into 3 in after we verified it 3 in and the calculator is right okay recreational vehicles recreational vehicles do you guys want to have a recreational vehicle okay no RVs RVs recreational vehicle park now remember we are not designing the vehicle itself thanks God that's none of our business uh it's a automobile industry Recreational Vehicle Parks they pull in they they can here's the option for these the rich people like Joe who work for the big companies they pull and they plug 50 in look at that plug how much air conditioning everything so they pulled with 50m then let's keep going here then the lower richest people like uh who Adam they pull and they plug with 30 or 20 with 30 with 30 or 20 cool and then the third richest Zach they pull with the 20 amps only so you see the amps going down and then when it tws your friend who I'm going to pick Brian he's nothing he p in a tent tent he goes in a tent not even RV sorry Brian I have pick on my car tent even just a tent not even an RV I have to pick on one but it's you today okay 55.7 38 can you guys go to 55.7 38 just let me show you um so we know what we know how how that goes huh let me see it was going the your way what did they say a 55 okay here we go where am I CH there you go um 55 551 okayish the vehicle and what's the other one 55 help me here what did they say 55 I have it here five5 5 okay 73 55 73a okay let's go to okay come on [Music] 73 are you guys there 5573 here you go right here so here's where uh where you guys are this is where this M4 is if you don't believe your friend Chad and I know you guys believe me anyway I want you to highlight this and highlight the demand Factor these two are going to be using them so um this is where the loads I want you guys to highlight if you have electrical service and theor shall be calculated based on 96 9.6 KVA pure site if it's equipped with 50 amps right and then 208 1220 the voltage 2820 or 120 240 it doesn't matter what the voltage is uh Supply facility and this voltage which is 3.6 per site if it's equipped with 30 30 or or 20 um Supply and this amount if it's equipped uh P side if it's equipped with 20 only can you guys see that and this amount if it's equipped with only 20 Supply facility that dedicated to a 10 that's Brian okay so these are where these numbers are coming from everybody can see that all these numbers are coming from okay so these are all the I hope you guys read it makes a lot of sense here when we write it okay I want thumbs up we know where the numbers came from number two then when you add all the amps you derate them there's a derating Factor based on how many receptacles do you have suppose that we have 50 receptacles um here's my 50 where's 50 Chad 50 is going to be right here I derate the amps by what 41 suppose I have only four receptacles uh here's my four CH what's my derating Factor this number everybody knows that derating factor table can you guys highlight this make sure you know where this table is before we go um and get a snapshot of that boy okay so that's um that's basically it okay so now now that you guys have have known where these came from let's go write them down in order okay 50 receptacles where's my 50 receptacles I have um where am I here uh okay here we go that's S I have 50 receptacles I'm going to use which color ch let's use black this time so for 50 receptacles I have um each one of them is going to be 96 everybody 96 right uh voltam let me just go here and okay 96 volt and 960 you're going to multiply this one by what 25 anybody knows why 25 and this is going to equal um 240 kv8 any question about where the 96 came to be where the 96 came to be anybody everybody understand where the 9600 came to be because of that article that's where is it here or here here 96 that's the 96 right here for the 5050 right okay so let's go back for 3020 receptacles it's 3600 360 multiplied by how many of them do I have these are the number of receptacles 15 and if you do the math that will get you 5 4 1 k v n a okay k v okay why is it two4 in top in the second one is the wrong one up to the second one is I just read it right it's 5 54 54 k b and a I saw the key as a one thank you the second one is 54 KV that's why I want you guys to verify it with me okay so who who was there Adam that's you right now where are we with Zach now Zack 20 amp receptical only the third cheapest and how many of them do I have based on that rule 2 4 multiplied by 10 and convert it to KVA that will give me 24 24 KV and a any question guys where these coming the numbers everybody knows where the numbers are let's flash them one more time is my 24 24 for the 20 only cool last but not least my friend Brian with his tent 600 multiplied by five of them they will get you uh 3K okay any comments about this one guys any comments any questions so that's the everybody understands where these came to be from what size of RV you can pull in the higher the AMS the more juice this RV is going to pull and if all H break loose you can have a tent size for the T that's another you're up the right I'm going to add him up now go ahead and add all these up you guys come up with 321 321 k v and a and you guys come up with something similar to that 341 KB okay I also want you to add the number of receptacles all the receptacle regardless of the amps all the receptacle regardless of the amps how many receptacles regardless of the the MS five five sides these are the number of SES the number of receptacle for each SES by the way everybody knows that a receptacle is a site that's where the RV is going to pull into a site plug into a receptacle right so when we add all these receptacles um they are SES so they can pull in including the tent is going to be 55 sites cool all right so let's go to 55 and find the daating factor since you guys are my friends um what was it 55 what's the the rating factor for 55 41 you got it so 41 oops don't go too fast Chad okay so I'm going to go here so here's what I'm going to do right I'm going to do this one right in this area here so I want to take my what did you say 0 41 now demand demand load my demand load is4 1 multiplied by 3 2 1 k equal what does it equal 132 132 k v and e that's your demand Lo did we do the math right anybody the same answer you multiply each one of them yeah you do it as total because you don't demand the Bas on 10 no you demand them y you add them up and you demand it based on how many you y toal you go to 55 receptacles regardless of the rich the poor and the poor and in between and you demand them I see your point these are bare minimum if you want to go adjust it to go higher than that that's fine too okay any question guys about this any questions 132 that's it so if you have an RV is you're going to calculate the load based on that so now can I move to the next one now that we know the load now that we know my load then I'm going to come over here and find the i i equal 132 k v and a divide this by I'm going to use 208 single pH I'm using 208 single phase my system here is 120 208 single phase everybody see that not three phase 1228 single phase 1228 single phase 1228 single phase everybody's cool with this anybody's anti that 551 shall be for single phase it goes single phase 120 normal for the okay okay 51 okay it's going 51 here these are all single phase systems and 28120 Supply facilities okay so these are all the calculation for single pH um so what would that get you anybody 635 R then you will to find the 635 G where do we go to find it the Walt 3-3 what do you get 800 amp does that sound familiar to you guys how over device 635 go down to here 2 4.6 that's 700 amp okay so we have a 600 and a 700 and 800 amp panel 700 amp over comption device right does is this okay Y no problem would it be a good idea to put an 800 amp and pull yeah some people say if the panels at 100 let's p on 800 col it's good if you're paying for it okay everybody got these two right all right let's go to the service entrance conductor service entrance conductor guys within Peril 700 IDE by two that will get me the first thing uh I'm going to get 350 a right take this one to table 315 B16 under 75° column you're going to get two sets two sets of two conductors because I'm only caring about the hots each one of them is 500 K CM t h h w what happened to the neutral we're going to derate the neutral in a second any question about the phases see how easy pce of K now let's do the neutral the neutral I go by load here's my neutral what's my load 635m take this one the first 200 M what do you do with them don't mess with them the left over 6 V5 - 200 multiply this one by what7 and what do you do with them add them up so that will give me 5 5 amps 55 amps any question guys about that why did you use 700 amp for good point uh if the conductors are landing on the fuse typically you size based on the fuse or a circuit breaker but the neutral is not Landing in the fuse right that's the justification it's not landing on the circuit breaker is there we don't land the neutral in circuit breaker 99 .9% of the time we don't okay so so then since i505 oops 535 was it5 5505 / 2 why do you think I divided by two 253 M do I have a choice here if the phes were two you don't have Choice and then you take your 2503 amp take these to table 310 15 BN 16 75° column and that will get you the following two sets what's what that this is this is what we call it Spike see how it spikes here trans all right so let's say two sets of one conductor and what was that conductor you guys came up with 250 K CM t h h and W two sets of one conductor 250 KCM THS w the last thing I did here guys we sized the conduit I'm going the conduit right in between here so I have two sets of two conductor number five 100 KCM and one conductor number 250 KCM and I need to size a conduit PBC schedule 8 okay so we go do it with the calculator since you guys are calculator Savvy now okay so let's go to the calculator oops uh where's my calculator did somebody steal my calculator okay here's my calculator so I'm going to go shall we first of all erase everything that you have done and let's go to the first thing I'm going to do the 500 5 0 0 K and wire right 500 KCM how many of them do I have two here's my two and here's hit the insulation hit the insulation again that's a cross-section area of the two together the two 500s next we go to 250 25 don't add Plus or I do anything 250 it's a kilo and a wire right so that's the second set the 250 how many of the 250 do I have one and then what type of insulation thn hit again that's a cross-section area of that conductor now we need the conduit hit the conduit it 3 in what did I come up last time I came up with a 3 in everybody came up with 3 in if Aaron came up with 3 in 3 in it is does that make sense guys we're going to start using the calculator because you guys paid $63 for pet sa even when Santa's not here yet you know all right so let's go everybody got where we come up with the three so my conduit is going to be what 3 in 3 in one how how many of them one so I have one 3 in PBC schedule 8 conduit does that make sense K I'm sorry two we're paring Chad so we're remember we're paring so how many conduits let they remember that we're par we have two conduits why two conduits because we're paring right paring two sets two no if you going to write it you would say two sets of and then one kind with 3in PVC schedual area two conductors BL if you put two sets at the top it applies to everything underneath it so two sets of one cond with 3 in PVC Schedule area so and yeah two sets of the whole P okay can I go to the next okay let's go to this is easy grounding elect to conductor now I remember I parallel two sets so here's my 500 KCM multiply this by two anybody can tell me why I did two 100 1,000 K CM right and then you take the th000 KCM you take it to table 250.66 and that will get you a healthy one conductor to O A WG t h HW or bear anybody disagree with that that's piece of cake huh let's go down Main Bing jumper the main Bing jumper guys is piece of cake the same thing you take the two multiply by 500 KCM that will get you a 000 TCM now I skipped the check what do you do here now you check can we do the check as long as we're on it so let's do the check the check is is 0 0 0 km more than 1 1 0 0 KCM what's the answer for this question that would be a question for fourth grader right no okay so if it's no then what do you do you just go directly to the table then and I like to spild it here because hopefully we because you guys will forget it if it's build hopefully it stick in your mind um took me a while to stick in my mind believe me so then you take the one KCM and take it to table [Music] 250.66 and what do you get same like you got up there one conductor number to at a w and g t h h w or bear or cover bar you see that check though you have to use the check with the m b jump last example when you guys are done the last example I have three of them we did mobile and manufactured homes Park we did RV park um the last thing we're going to do my friends is the marina now this is for the richest Among Us who have boards and they're going to pull their boards is that Adam no Adam Joe still Joe Joe we got we gave you 50 m uh 20 120 man RV plug so okay so then they have no money now let's put Jeff on that on with the with the boat okay any question guys before I move into the marinas that's where you plug your uh 150 foot boat is there 150 okay get a of it all the money 55 let's go to 55 demand factors for each service a Feer calculated based on in according okay shall be permitted for each service calculation these okay if you guys go to this site on 250 this will be uh where am I here uh 55.2 Table 5 5512 theand Factor the way they do these These are outlets right you plug an outlet a marine equipment in an outlet and you feed your Bol right the way they do them guys they add all the amps can I get you guys for a second they add all the amps and then you they apply a demand Factor here's the demand Factor if I have 5 to8 what's my demand Factor 90 if I have four what is that 41 to 50 my demand factor is one can't even read that one 50 50 that's here so if it's uh if it's 41 to 50 my demand factor is 50 everybody knows how to use this table can we go there and look at it guys make sure you highlight it before we start okay so here's what we're going to do first we're going to add the amps I want to remind we'll get back to this table we flip on it let me go back to you to tell you okay here's our situation we have a marinaa a boat yard over Marina Boat yards and for my marinas or boat yards I have the following I have I need a panel to feed all these pistals pistals they have Outlets they going to plug into to feed your boats and Marine equipment um this what I'm we're designing you for the following sites I have 21 peristal with an outlet of 50 a two pole everybody's okay with this those are for Jo people like Jo rich people 50 m the higher the am the Richer the person is so Jo's going to go 50 amp two pole 21 of them then we go down to the poor people whom did we say the poor again Andrew let's pick on Andrew today then Andrew 30 amp two pole his boat smaller he's going to plug it into a 30 amp two pole and we have 19 for the people like Andro then we keep going to cheaper and cheaper so who am I going to pick on now Carrie carrye my friend 20 amp two pole smaller board uh we have 10 of them we don't care about the poor people we don't want them there and then uh okay who Aaron now we're going to pick on Aon did we pick on your a uh okay Aaron my friend the poor of the poor oops did I say that we're going to give you this's what we're giving Aon can you guys see that 20 amp but single phase single pole that's what we give the kitchen right that's what we give the kitchen so 15 of of the the poor people with with 20 amps everybody understand what the system is everybody understand what the system is and these are plugged in the number robot so my job uh Darren my friend is to size the panel size the service overcome of eyes and disconnect and the service conductors size the conduit the conduit we will be size the B bonded jumper and the grounding El conductor same thing that we have been doing does it make sense okay all right so everybody knows what this picture is right everybody knows what this picture is cool that's the most important thing um before I I like to I like to add a couple of things here to your picture guys so if you have a 20 amp single pole circuit breakers what do you think that cable going to a 20 amp receptacle would be sized it's a single pole how many conductors with a gr single pole two conductors and a ground so I'm going to put it three conductors number typically unless it's too long it will be number one 20 M goes with what these the receptacle number 12 number 12 number 12 a WG these are just sizing for the amps just sizing for the amps piece of C let's go back to here two 20m two pole 20m two pole D are 240 we're giving you a 240 system okay 240 so we're going to go three conductors two huts and a ground same thing number 12 a WG and the insulation would be what t h h w t h h w so let's go to the richest people here two po so three conductors anybody knows why the 30 MD three conductors two hot and a neutral right unless you have I'm sorry two hot and and a two hot and a ground unless you have one 20 then you have four so let's assume just we're assuming here three conductors so that will be number what number 10 a WG everybody's following I'm just sizing for the amps here t h h w it's go to 50 what would the number number 50 be now these are receptacles you going to size them based on 60 60 degree column three conductors at least three conductors probably before uh number what number eight I have number eight everybody's okay with that number eight 8 w g t h h w so I'm sizing I'm sizing the brand circuits guys very easy based on the full load current of based on the the circuit breakers now that 50 most likely would have a neutral with it so it might be four conductors why three conductors on the same why three conductors in the single pole because one for the hot one for the neutral and one for the ground why in the two pole one for the hot one for the hot two Hots and one for the ground yeah if you have two pole you need two Hots but you still need a ground if you have single pole you have you need a hot and a neutral right and you still need a ground make sense good point though okay so this is not what the exercise is this is just bonus how to size these okay let's go go to the exercise um so we know where we are okay let's go with so here's my exercise um I have 50 a 250 volts 30 amp 250 20 amp 250 and 20 m 120 receptacles these are all my receptacles cool I have the number of receptacles 21 of each 21 19 10 15 can you guys see the AMS and the voltage for each one of these recepticles okay so look how they do them they do completely different did you please do that one Dar at your school did you do any calculation like this okay now they do differently here they do differently they do differently I going to see it over the years it gets some so I'm going to take my you go there you go come on and move it Chad and move it again then I'm going to grab my calculation here it's right it's really nice to do a schedule because it makes it it makes it uh makes it easier okay do I have another line here I have a l line but I didn't do much with it okay let's go ahead and do it um so here's how we do it now I want I want you guys to pay attention now see what they they they divided them between the two hearts remember my system is 24120 my system is 24010 so this voltage here is 240 120 Vol that's single phase of course single phase cool now going back so if you have a 50m 240 do you think the 50m will be seen by the two phase the hearts if it's 240 it's too poor so that 50m will be under the the hot one and under hot two so you're going to put 50 under hot one and 50 under hot two why because it's too 40 it will be sucking 50 amp from hot one and sucking 50 amp from hot two okay 30 amp same thing 240 where do you guys think that that's going to be taking that much that stuff and then so that's the first thing then how many of them do I have you're going to multiply this by how many 21 and you're going to multiply this one by how many 21 why 21 because I have 21 of them make sense they will be seen under each hat because they're sucking each one of them sucking 50 from each heart and it will be multiplied by 21 because there 21 of them okay let's go to the second one uh 19 multipli by I the same thing two 4 so that would be 30 m um and the same thing I'm going to use same convention 30 amp times uh 19 let's just be standardized hereit go One Direction okay so let me let me make it 21 how many of them times 50 and then 19 how many of them times 30 amp amp any question about that let's go to the second one 20 amps 250 same thing 10 multipli by by 20 amp 10 MTI 20 amp any question about that piece of cake now here's where I want you to wake up my friend this one is 10 uh 20 amps 120 ah now if we have 120 they're going to be seen by either hot one or hot two it'll be fooled to put them all in hot one you'll be foed to put them all in hot two so what's the smartest way to do is to balance them between hot one and hot two so could you please divide 15 by two and tell me what that would give you eight on one thank you it has to be okay pick one leg that you want to put the eight on eight so we put the eight on the first leg so8 mtip by 15 M and the lift over will be 7ti 15 M everybody knows why I didn't multiply 15 uh 20 amp I'm sorry 20 amp 20 amp y so that would be 20 amp and times 20 right everybody knows why we don't multiply the 15 in both sides because these are they are single phase single pole so you can divide them as you should between the two HS you should divide them equally if you can but if you can't this if was 16 will be8 since it's 15 is 87 excuse me any question about this so piece of cake the reason why we're doing this guys because we're going to balance them now okay so are they balanced the two40 piece of cake they are balanced by it so we don't do anything we just multiply them and we put them on the two legs the only ones that you have to letter is the 120 ones cool can I have thumbs up Chad we fully understand that yes okay so let's go add these boys so when you add them um so multi add all these together multiply and add um I came up with 1960 here 1 n60 M on this leg and 1 1980 1 980 in this leg anybody came up with something different 1 1980 1 960 okay cool okay so that's that's the adding the adding the the amps all together now adding the receptacles on each leg all the receptacles on each leg all the receptacles on each leg okay receptacles on this leg is how many of them 57 receptacles the receptacles on this leg is how many of them 58 receptacles right can you guys see that so first I added the amps then I added the receptacles okay now any any question about this so I put added the receptacles in both of them now then here's what you need to wake up now you're going to pick the one that have the large the largest L which leg is going to see the largest a that's piece of picture so we are looking add this for sizing can you guys see that why did I pick this because it has the largest what amps and always the one has the largest amps always have the largest what number of recepticles that's why he has the largest amps right because he has a l largest number of recepticles so the only difference between them is really 12 recepticle thrown in this side so you always pick the one with the largest one M why because when you size you size based on the worst scenario the worst scenario is the largest amp coming from one leg cool the reason why they do them this way guys because you want to balance the loads on the two legs okay any question with the 1980 amps yes if you have I'm sorry one one absolutely you don't throw them with the other one yeah all the two four you guys are balanced all the two for up to this everything here anything that says o to use a different color these ones these ones and these ones are completely balanced on the two HS so you don't have to worry about them the only one that you need to balance the only one that you need to balance are the 12 120 l so I could have a 100 of this type here they still be the same 100 \* 50 100 \* 50 99 will be 99 \* 50 99 \* 50 because they're balanced they're coming from the two hearts now I have 55 receptacles 120 now I have to divide them equal what's 55/ two 27 20 7 and a half so that will be 28 27 and 26 28 27 28 27 does that make sense we balance them cool can I have thumbs up we know how to do that Chad okay now let's go size that boy now we know the m now that we decided what the amps are excuse me now that we decided what the amps are you need to go and find the demand now remember the table so I have um no now let's go did we find a demand for how many recepticles we have so how many receptical total all together that we have on one leg 58 okay what's the the rating factor for 58 50 is this it here for 58 for point4 point4 58 is 04 right 58 is point4 everybody can see that right here all right so let's go to multiply this one so here so the first thing I going to write here is um okay we got that one get this one get this one Chad so we're going to have 50 for 58 receptacles the The Waiting factor from table can anybody give me the table five 5 5 two one two 12 thank you what's the the rating Factor 40% okay that's the first thing you need to do second thing is take the4 multiply by how much amps you got the largest amps 1 1980 what do you get you get 792 F that's your demand demand load they call it demand load that's your demand load that's what you're going to size for 792 M cool we're done when you C capture that number now you're going to size another rest is history right everybody get that I'm not going I'm sorry everybody knows where the 58 gave me 40% the rating Factor Why do you think they the rate highly unlikely that all the rich people and the poor people are cooking and air conditioning is running in their uh marinas charging the batteries at the same time diversity Factor diversity Factor yes the highest absolutely the largest amps and the largest receptacle for the datic factor cool okay then just a quick reminder that the M that we came up with was 17 92 M that's what we're going to be sizing for then you take the 792 amp take this one to d wall 3-3 like we're showing up here and that will get you a healthy 800 M what's with the 800 M that we keep stucking with here then you do the 7 92 M that will get you again 2406 it'll get you 800 amp again so the panel and the overation device both of them are 800m piece of care seems we love the 800m panel let me know when we can go to the last uh two or three okay yes no okay uh service entrance hot and neutral let's do the service entrance conductor guys hot and neutral okay so for the hots we par 800 / 2 = 400 right and from here we did table 310 15 B 16 under 75° column we came up with two sets of two sets of uh 600 right we just did that 600 KCM t h HW and how many of these two single pH right for the HS right is that what we did for the hearts cool any question guys about that one for the hearts let's do the neutral neutral these are Hots neutral for the neutral here's what we did take what was the size that we came up with the actual size how much 792 you're going to take 200 amps and then uh 7 92- 200 amps and multiply it by7 anybody can do this math I did not do this math I need somebody how much 614 M I need a second on that second where's my a students here Adam they're pointing at you 792 - 200 \* 7 + 2 614 okay thank you second like I don't trust you but I like a second okay then from here you're going to take the 614 / 2 that will give me [Music] 37 right 307 M 307 then you take the 307 amp to 310 15 B 16 75° column what do you get you get how many sets first two two sets of one conductor number 350 KCM this is not even close if it's close we go k cm and T HW cool any question so we found the hot neutral did it we size this a minute ago what was the conduit size that we came up with this yeah 3 in and as long as we are on it I believe we size it didn't we size something like 600 with 350 I swear we did size 6350 conduit it yes 6350 we came up with three okay so I'm going to size the conduit I'm going to do the conduit here um so that will be um two conduits we p b c Schedule 8 and zero cool that's a conduit for it that conduit will take care of this and will take care of these too any question guys always find a conduit a gentleman would not move conductors without a conduit okay let's do the main uh what are we do last one um GC grounding restored conductor grounding electrode conductor so what do we do we take the two multiply the two by um multiply the two by uh 600 K = 1200 K C and M then you take the 120 0 KCM take it to 250.66 that will get you a healthy one conductor number was it 12 we did this before or three out v a w g t h h w cool now the last thing and this is busy I'm sorry I I made it busy here for the bonding jumper don't forget that this is 25028 when you go there you can do the same math 2 \* 600 KCM uh equal 1200 KCM then you're going to take 12 and a half% multiply it because this is more I skipped one step here it's more than 20 equal 150 right 150 M KCM and we took this one to chapter number nine table number eight you guys remember that and we came of which what size three one conductor we a WG is that what we came up same conductor basically same like the one yep one conductor three y okay here's your sorry I I scammed all and the installation going to be t h HW or be any question guys about this I know I crammed everything at the end but we've done that right we've done it many times yeah it's meeting the the whole the whole thing any comments any questions any comments any questions so now my friends we size the service panel the service overc computation device the service conductors the service neutral the hots and the neutral and the service bonding jumper and the service um grounding electr conductor would you guys be able to isit when we put in a test yes no now remember what did Chad say about cheat sheets you're going to have yourself a cheat sheet you have a support line too you can call you significant other friend YouTube as long as you don't call me that support line okay any question that's all I have for you we're done with this load calculation next week we're going to do Transformer calculation for this semester anyway and then we'll flip into the lighting business cool uh next know the week will be a week after I know it's a schedule says next week right but I can't remember you look at the schedule I don't even if it says three we're not going to be able to to do a test next week I can tell you we are where we should be guys so we're not behind so thank you"

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"VideoID": "3194",

"Title": "Direct Expansion System - DX System for Electrical Engineers - Lesson 2",

"URL": "https://www.youtube.com/watch?v=wwFcVi24XfY",

"Keyword": "Electrical load calculation",

"Transcript": "hey everyone and welcome back to the HVAC system for electrical engineers in this part we will talk about the different types of HVAC systems so the first type which we are going to discuss is called the direct expansion system or the DX system so the direct expansion or direct or a direct uh or DX cooling uses the principle of thermodynamics to transfer heat from one area to another so the evaporation and condensation of a refrigerant now you may ask me what is even a direct expansion system it is exactly the one we discussed before okay you can see that the remember the cycle which we talked about how does an air conditioning work in the previous lesson it is exactly the same this is the direct expansion system in which we are cooling in which we are calling our uh using our Freon or called uh freon or our cold refrigerant directly to exchange with the atmosphere or exchange with the room with the air inside our room in another system we are going to do another thing is that we are going to use for example a refrigerant or a freon in order to cool water and then using this water to cool rooms in a building this is a chiller system a different types of a different type of an HVAC system this one is called a direct expansion system now air conditioners refrigerator and freezers using the DX Cooling in order to remove thermal energy from inside to outside all of these use the same components that we discussed before inside an air conditioning system you remember this cycle exactly the same when you compress the um gas or refrigerant and then uh cool it down using a condenser by using a fan to the in the outdoor unit and then bringing it in using the expansion valve which will expand it and cool it down and then using an evaporator to uh evaporate our uh refrigerant from the liquid form to gas form and exchange heat with our room and the cycle repeats this is exactly the one which we discussed before now let's look at its types what are the DX systems that we can see these are some of the types which you can see in your own building or in a different projects so for example we can have a window and ductless ductless it means that we don't use any duct in this system so in the window type which you may have seen before in the window we will have the indoor unit which contains the evaporator and the outdoor unit which which contain the kind condensator and compressor are attached to each other one block inside the wall we call it a window unit like this remember inside this can be found in Old homes um for example you can have the indoor unit and this is the outdoor unit they are STI to each other this is what we call a window and it uses the same principle which is the um the one which we discussed right now in the previous which is the DX system or uh using the direct expansion uh system or direct expansion uh method and this is another one you can find it here and the other one you can see here there is a plug for this uh air conditioning system and outside you will find the uh outdoor unit behind it um stick behind it so this is what we call a window without any kind of duct another one which can be found in modern homes or uh newer systems uh other than the window type is a split systems so the split system is that we can see in our house in my own house and in many other house you can find here that we have um the indoor unit and outdoor unit and why do we call it a split because you can see that it is not one block like window in window we had the indoor and out outdoor stick to each other one block however in this type the split system the indoor and outdoor are split or they are separated from each other here is an example you can see here an air conditioning here and the outdoor unit and if you look carefully at this uh drawing here you will find that we have this weird box here this weird box is our disconnecting switch which we are going to discuss later how to design it this disconnect s is used to um cut electricity from this uh air conditioning system or the air conditioning system in order to do maintenance on it another type of the ductus without any kind of duck is called the floor mountain and floor standing you can find this this one is found also in my own house in a reception you will find this one which is a floor mounted and there is also a floor standing different types of systems which you can see the cassette there is another one called the cassette what is exactly the cassette it looks like this this one as you can see this is what we call a cassette that provides also uh cold air to our system as you can see here again the cassette is also connected with the outdoor unit we have an outdoor unit and we have an indoor unit this one used to provide uh air uh cold air to our system and it's connecting connected to uh our outdoor unit you can see that this outdoor unit can provide to different split uh system these two split system and two cassette again it depends on the design of the mechanical engineer now there is another one called the ducted or Central split so it is a split but it is Central what I mean by Central Central because it doesn't call just one room it can call several rooms it may be even one complete floor in a building again it depends on the design of who of the mechanical engineer not my design I'm not a mechanical engineer the mechanical engineer is is responsible for Designing and selecting what suitable system is used and what values and what kind of horsepower all of these are its own job it's not my job so the central split here you will find that for example we will have one big unit outside and you can see again the disconnect switch here as you can see here this one outdoor unit and it provides uh provides cold air to the building using to the house or home or uh floor using duct and you will see what I mean right now you will see that we have here what we call diffusers that provide cold air and there is others which take air so there are diffusers that are in takes air uh warm air and others which will provide cold air so let me show you what I exactly mean or how does this system works so you can see in this this is a house here and you can see we have many many diffusers here that provide cold air cold air to this house here now let's see so we have number one outdoor unit outdoor unit which contains the compressor that compresses this Freon okay so it compresses it and at the same time you can see we have many Vance here which calls it also down a little bit and then we will see that this um hot Freon or hot refrigerant will go through pipes or refrigerant Lin you call this refrigerant lines or pipes and it goes like this through an expansion valve so we have an expansion valve that will you can see that here goes like this and you'll see we have an expansion valve which will provide a cool liquid Freon or refrigerant okay liquid coed uh refrigerant and then what we are going to do is that you will find that we have another unit inside the house which is called the plower here this one what does it do you will find that it takes air from the building you can see that we have some diffusers here or vent here you can see this vents here it can be located any locations and you'll see all of these ducts you can see this one is called duct so what will happen is that we by using this flow here we take air from the rooms hot air from the rooms like this we take hot air goes all the way down here so this one this flower here this one takes all of the hot air from the system okay great and then what after taking all of the warm air from the here it will push it through the the cold refrigerant remember that after getting through the expansion valve we have here a cold refrigerant and then when we pass this hot air through it it will become a cold air and then we will pass it through a duct and then we provide cold air to our house so you'll see that these ducts which will have warm air it will be absorb it using this flow here push it down here and then it will push this warm air through through the cold refrigerant and then we will have cold air that will go through these diffusers or this vent that is how a central split works exactly the same principle in other systems so you can see we have duct here that will take uh hot air and another duct which will provide cold air there is another one called the package it unit so what does the package unit do it contains everything together everything inside it and it is usually placed on the rooftop like this one here you can see it is placed on the rooftop of an house and then it will start supplying cold air through you can see providing air air and air cold air through the system and we will have also here you can see we have a return air duct which will absorb hot warm air and again provided here to do the to the evaporator which will exchange ha air which will exchange heat with it and then will provide cold air so as a packaged unit contains everything together in one block so these are the different types of the DX system uh operates on the same principle you have a refrigerant that we uh compresses it and then we expand it and then after expansion we exchange it directly with the air inside our system now in another system called the solar system we first use the refrigerant in order to cool down water and then we use this cold water uh inside our building as you will see in the next lesson"

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"VideoID": "3196",

"Title": "Electrical Blueprints - Identifying Circuits and Homeruns",

"URL": "https://www.youtube.com/watch?v=ODbWYYGo\_d0",

"Keyword": "Electrical blueprint reading",

"Transcript": "hey what's up guys this is john speer with warhammer electric hope you guys are having a great day today we're going to be going over how to find a circuit on a set of plans and then address it to that panel so we'll just kind of go in really simple so we're on the lighting set of plans which in this particular case is e 101 it's the level one ceiling lighting plan so this is giving you all the designations of you know lights that you're going to be installing however if you want to know where these circuits go and how they address you know sometimes you get asked like is it 120 is it 277 what is it you know so what you're going to want to do is we'll take this one for instance a 139 which is designating that this is panel a1 circuit 39. so in that case you know we'll just kind of kind of bubble it just for whatever and so a139 so what you're going to want to do is come down to your panel schedules find panel a1 which is a new panel and then circuit 39 and then that's going to tell you you're going to use a 20 amp circuit which means you're going to be using number 12s for that lighting circuit um this will tell you the you know the estimated basically you know the educated estimation of the load and demand that like what it's for so it's saying that this is for lighting it has a volt amp of 1300 so and in circuit 39 which is on the b phase and you'll notice that this you know only has 13 13 because there's only a space on circuit 40 which is the other side of b phase so then we'll do like a receptacle kind of tracing out i guess we'll stay on lighting for a second so when you're running your conduits or whatever you know you'll notice that you got all these in a row right 37 39 and 41 so what you could do is bundle those together and like put a like a j box in the middle and then this could be your home run going down and then it basically tailing off to you know all these individual ones and obviously you'd make it a lot prettier but that would be the ideal case right there because as you can see um a141 goes from here to here and down all the way right so there's particular cases like that that can help you out through that but this could cover a good chunk of your stuff just right off the bat you know because this is feeding your b4s down this line it's also feeding these j boxes for these track lighting you know so you know start it in it doesn't have to be up here like you always want to put the boxes wherever the panels are going to be so the panel is like right here then you obviously want to make your boxes over here but in this particular case your panel is going to be right over here so over here makes the best sense right where you're gonna put i guess we back it up and essentially your box will be right here your home run box anyway your home button home run box will be right there and then you'll gradually go this way so boom boom and then from here to the panel or a1 is right here so you know when you're setting it up estimating wise this is kind of what you want to do um so you'll have you're hot you're neutral hot you're neutral hot you're neutral and then ground and then hot neutral hot neutral and then hot neutral ground ground so then it just gradually goes down from there but that would be the best way to set it up and then same thing with the receptacles exact same scenario um looks like in this particular case you got a 1 14 and 16. so if we look at that go to a1 14 and 16 it's gonna be on your right side right here 20 am 20 amp i'm going to use number 12 and you know basically set it up that way right and you can pick something along the way what i like to do is just like kind of get a baseline of where it's going to go right so that's 14 and 16 i have enough to put one more full circuit in there so and just set a box right here right in this line and then now i can pick up 18 as well you can see that so now i got 14 16 coming to here and then 14 16 and 18 going home so that's like one quick way to kind of you know do is find like the farthest you know singular one and then pick up ones along the way and you know that's um you know how i do the the estimating portion of mine of my work when we're doing stuff like this um i hope you guys like this little video on how to find circuits from plans to uh panel you know um the panel schedule will tell you all kinds of information on it it's a 100 amp it's an mlo main lug only and there's also another one called mcb which is main circuit breaker which basically saying that you know it's it doesn't have a main um i mean break it turn it on or off main leg only is strictly just lugs so um that typically means that there is a breaker nearby that's within sight that it's located in the break room it's fed from panel a which would be this guy and then it's 208 three phase so it's three phase 120 208 four wire which means it has a neutral so obviously it should it's neiman one so it's indoors surface mounted and it has that aic of 22k yeah so once again hope you guys like this video um this uh video was dedicated to a gentleman named dwayne who posted a comment asking for this very specific information so there you go bud if you guys have any other questions i do answer them um in the form of another video if possible if it warrants it or makes sense so um there you go this one's for dwayne hope you guys have a great day and thank you guys for watching once again my name is john speer with warhammer electric"

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"VideoID": "3199",

"Title": "How to Read Electrical Schematics (Crash Course) | TPC Training",

"URL": "https://www.youtube.com/watch?v=Et-gHKTdziU",

"Keyword": "Electrical blueprint reading",

"Transcript": "hello everyone and welcome to today's free public webinar with tpc training entitled a crash course on how to read electrical schematics my name is ryan smith product manager here with tpc training and we are joined by one of our expert instructors marty redman uh expert here on electrical schematics and he's gonna tell us all about uh the different types of electrical schematics so some of the symbols we might see in the field and really just just some really applied knowledge on reading schematics for this little hour free session we got here today so um before we jump into the presentation i really wanted to let everyone know that today's session is being recorded and the recording video of this webinar will be up on our website the dpc training website and will be sent to you in an email within about two business days after the completion of this webinar so be on the lookout for that also the pdfs of these slides will be available for you on that same website for you to download and share with your co-workers and finally this session is live right now and so because of that let's interact let's ask some questions for marty um and we'll be able to get to them at the end uh end of the session here so to do so um you'll see your kind of toolbar at the bottom that has some options there at the bottom of the toolbar you'll see something called q a and when you click that q a button it'll bring up a little window that gives the opportunity to type in a question um go ahead and type in that question and it's going to come right to us here on the panel and marty and we'll be able to answer those questions uh at the end of the session so definitely feel free to use those we look forward to answering and having this open discussion with everyone here so as we get into talking about electrical schematics i'd like to learn a little bit about who's here and who's tuning in so we got a couple really quick intro poll uh introduction poll questions for you and so what you're going to see showing up on your screen right about now right about now you should see a window popping up somewhere on your screen that has two questions uh just asking you about your experiences with electrical schematics and what you can do is that uh click on the answer and it should register your answer for both questions and then submit when you're done with the question us with the poll so the first question is how easy is it to find electrical schematics for equipment at your facility would you say it's very easy would you say it's easy would you say it's you're neutral about it neither here nor there that it's difficult to find schematics or is it very difficult to find schematics in your facility we're getting some great answers coming in and then the second question is how comfortable are you in your ability to read and understand electrical schematics and you can be honest right um very comfortable are you comfortable are you neutral are you more uncomfortable or very uncomfortable reading electrical schematics and kind of understanding what's going on on them so we're getting some really good results coming in here i'll give you maybe just a few more moments to get your answers in and if that poll didn't pop up for you no problem we'll share the results with you after this webinar so uh looks like the questions are evening out for the most part all right so i'm going to go ahead and end the poll now and i'm going to share the results with you so what you should see now is a window popping up with the results of today's poll so we can see and what we do find is is these same results out in the field is the the availability of schematics is all across the board and so is this skill level on understanding how to read schematics it's all across the board so right in the middle of the road we have neutral as an answer really so so kind of neither here nor there on how easy they are to find so thankfully um the so 40 of people are neutral to that but 35 looks like they're easy to find so if you know where to go look for them whether it's in the uh you know engineering binder in your maintenance office or in some sort of electronic format on a shared drive you can get to them easily and some of you about 16 percent of you are finding that it is difficult to find them so definitely one action item we find is making sure you know where to find your schematics and then finally how comfortable are you with your ability to read schematics the answers are all across the board uh some of you 28 of you are comfortable 34 of you are neutral and 25 of you are uncomfortable so really it kind of goes all across the map and so that's really good for us to know um for marty as we're getting started here is you know there's all sorts of skill levels being represented here on the session so go ahead and feel free to press the x button and close out the poll results on your screen and uh now we can start learning really more about the ins and outs of some of these electrical schematics so marty thank you so much for being here thank you ryan uh just let everybody know that uh i've been in the electrical field for over 40 years and have been with tpc training for over 14 years so um we understand a lot about what you're going through when it comes to prints and the difficulty in getting them uh the difficulty in the fact that it seems like every print that you may get uh is different has different symbols as different numbering schemes and so uh it's an opportunity i guess for us to try to better understand prints know where to look for that information and uh that way we can better troubleshoot and and do it safely because we can read the prints and and we know what's going on in that particular piece of equipment or on a production line or whatever you may be in so there's some things that you know we need to know and so as we go through we start talking about things we need to understand uh understanding how electricity works that seems like something very simple but you'd be surprised how many people really don't understand it and how it works and we kind of need to know how it works so that we can use the drawings to the fullest extent so we'll talk a little bit more about that and then we have all different types of drawings so depending on what the skill set is depends on the drawings the symbols and abbreviations uh that's always been a hard thing because uh depending on the engineering company uh the machine company or whatever symbols and abbreviations aren't always the same so we'll talk a little bit about those too uh understanding how devices operate this is something that uh in the field we need to know more about the devices whether that's a motor starter or whether that's a vfd drive or just something as simple as push buttons or three position selector switches it's very important that we understand how that device should work uh so because we're going to want to kind of troubleshoot it and if i don't know what a good one is it's going to be a little harder to determine whether it's bad or not so we need to know a lot about the devices that are on that piece of equipment to help us troubleshoot if you do have prints which some of you do in your machinery you know we need to look at that title block on there because that's going to give us a lot of information about that machine so a lot of those are down that title block area we're going to have notes and updates to those drawings and they typically have numbers or triangles or clouds or something to distinguish where things have changed and so if something's changed we should go out there and look at that to make sure it hasn't affected what we are doing or what we're thinking about so we we need to know a little bit more about those and uh we have a lot of machinery now that comes from foreign countries and some of the drawings for those machinery are done with iec or international electrical commission drawings have versus nemo which we're used to in the united states and so if you don't know the key on how to read those drawings it makes it more difficult so there again we have lots of opportunities uh to spend some time learning about all of these drawings and uh and then when you don't have drawings that's that's makes it a little tougher so um i know that uh if you were to come to one of our schematics classes we actually teach you how to make a drawing if you don't have a print and with most machinery it seems like the area that's a problem is usually the area all the time it's usually the same place most of the time so we can make a drawing of just part of the machine to make it easy for us to troubleshoot and that's what we're after is to keep production up keep people safe so we go through some of these things understanding how electricity works so very important to understand uh where my source of energy comes from most drawings are going to show me that most drawings are going to indicate where that is but many many pieces of equipment many panels have many sources they may have three or four sources i and those those should be marked on the front of that panel to let me know how many sources i have it could be coming from a backup generator i don't know uh but i need to know where that source is because usually at that source that's where my over current protection device is and i need to know how to turn the power off to that machine if i need to get into that machine to repair something a lot of people and i've seen them many times they're following a conduit back someplace uh to try to find out where the uh over current protection device the breaker or distribution panel or whatever uh is that's feeding that piece of equipment and they go back there and they you know turn the disconnect off and they check yep got no power and that's it when they get done they never identify anything they don't market so when you take the time to find something make sure you identify it so that everybody gets to know where it's at just just not the person just not you so we need to know where those sources are and control power doesn't always come from the same panel and might come from a different panel a different source so always make sure that you understand just because i turned the disconnect off and locked it off doesn't mean that there's not power inside that panel and the drawings if you have good drawings should show you that the other part of our circuit is that we have a load a load is usually something that does work for us it could be as simple as a pilot light or it could be a three-phase motor but i need to know what that is and i need to know how it works back to my devices i need to understand how they function because the drawing and the symbols on there are going to give me some information and i need to know what that is then we get to our current flow our flow of electrons through that circuit um very important because i may not have the over correct over current protection device somebody could have changed the fuses it's very important to know what what that current should be for that particular load and so that i know i have the correct size wires and all the information i need to do this is in the national electrical code so that's where i get information if you're doing motors article 430 is all about motors it gives you all the information you need to understand motors and overloads and all those things and same way with our path our wires that we're using to complete that path to all those devices they have to be sized properly and obviously if i go to the code we don't even call them wires it's not even in there they're conductors and so we need to to know what those are because when i get on a print there's not going to be any wire sizes on on most control drawings they're just they're just drawing lines that take me to show me that path that the current's supposed to take so i don't know what that is there'll be another drawing someplace that's going to give me that information but it's probably not going to be the control drawing that i'm on so very important to understand how the path works what i have to have in a circuit to go and so i can follow that through my drawings here we just have a list of several different types of drawings most of you i'm sure are probably familiar with a single line drawing that we have and typically shows us our main distribution in a facility and those voltages could range anywhere from you know 120 all the way up to 4160. it just depends on what you're doing in your facility but a single line diagram means we use one line to indicate where the path goes instead of three three lines would just kind of mess up the drawing a little bit so we call it a single line because we use one line we show symbols of disconnects or fuses or whatever in there gives us that opportunity to know where things are going so if you're in a facility uh typically your one-line diagram has a numbering scheme to it not all of them do but most of them do and in that scheme is always trying to get you back to the source so if i have a lighting panel out in the middle of the facility the number on it is going to be somehow associated typically with the breaker over current protection device that feeds that panel and it's always going to try to get me back to the source and and that's what we do with distribution so unfortunately a lot of you probably don't have someone that keeps that up to date as we change things in a facility and move pieces of equipment around a lot of companies don't have that person that keeps that up to date and before you know it it's very outdated and that's a bad thing because that's a safety problem and i can tell you that osha can't find you if your one-line diagrams are not up to date because like i said it's a safety issue if you have a distribution breaker turned on uh and it's drawing current but there's nothing on there that identifies it that's a problem that's that's a problem because people don't know what to turn off or what it's for so uh try to try to keep up with your installations in the facility if you got a engineer that's really great that definitely helps our wiring diagrams that show locations of terminations and stuff some of you may have them on prince some of you may not it just uh it really depends on the manufacture of the machine or the engineering company uh a schematic diagram says here electrical operation kind of showing you where the relays are and how things are connected [Music] ladder diagrams are something that probably most of us have for most equipment that's in an industrial facility and typically the reason we use that for controls is that it just shows us the path the current has to take to energize the load it doesn't care where it's at could be two feet apart it could be 200 feet apart doesn't really matter it's just showing us the path what has to be closed on that line to make that load energized so it's a very simple drawing uh floor plans basically show us that maybe you've got a motor control center where is it at that that print is going to show you where those things are are where the panels are in the facility so um all these different drawings are for different things and then we have a site plan that kind of locates you know where the power is coming in and if you have transformers and those kind of things where they sit on your property and how the facility sits in there so we have a lot of different drawings that help us find the things we need unfortunately if you don't have an engineer to keep these up to date uh we have things that we've put in and we don't have a record of any of it other than it's there and it's working so that's a problem uh but you can overcome it it just it just takes time to get things uh down on paper someplace when you have time uh and you know if you uh haven't had much time to go over drawings like a single line you know when you have time in the break room or something get those drawings out and put them up on the table and and spend some time going over that and try to figure out what numbers mean and what symbols are so that's the day you need it you know you know just got it you got to check things out symbols i wish i could tell you that uh symbols are all the same in all the drawings but they're not um everybody seems to have a better mousetrap i guess and so we have lots of different ones i would tell you that uh probably since the 90s anyhow uh we've gotten better at that because of automated cad drawings and these canned packages they have for symbols so i think more of engineering companies try to use the same symbols and that makes it easier for for you but with all the different disciplines of drawings architectural mechanical electrical plumbing civil whatever it may be they all have their own set of symbols and abbreviations so if you can only imagine what that is that that is an awful lot to keep in your brain uh to know what they all are and that's that's just about impossible i guess but uh some of you may be able to do it so one of the things that should help us um is that uh most drawings at least when they were new uh have a legend sheet and the engineering company uh draws every symbol that's in that drawing on that sheet and explains what that symbol means so if you don't have that sheet it makes it a little tougher to figure out keep in mind that since the 90s most drawings have been on cad autocad and so for a lot of you you could probably go back to the manufacture of your equipment or the production line or whatever and you might be able to obtain new electronic drawings you may have changed them a little bit but they'll probably be 90 80 right that's a lot better not having any drawings so uh there is information typically there for you uh but you got to spend time there reading it and the downside i guess is that a lot of times we don't get drawings out until we just got no place else to turn to and then we get the drawings out and we don't understand the symbols because we just haven't been there we haven't had time to figure that drawing out so again when you have time get them out and try to look through them and try to get that understanding of what that engineer meant as he was going through there uh symbols are something you know we look at been doing that for what thousands and thousands of years people have drawing pictures and things to try to get us to understand what they mean and so uh with all these different disciplines we've got the same thing but we have to understand that uh if we're going to use that drawing to troubleshoot we have to be able to understand what the symbols are because i don't know if you've ever tried to write down off a drawing how many words there are on the drawing but there's not many words so you're not going to get much meaning unless you truly understand the symbols okay so symbols are something that uh there's a lot of books that have symbols you can go to the web and get symbols there's just a lot of different places that can help you depending on what has happened okay over the years so uh try to get those get them understand when we get into uh machinery typically we have symbols for power and we have symbols for controls depending on how large the machine is you may have all the controls on one set of prints and all the power on another set so you might have two or three pages that are just power and several pages that are the controls and through a numbering scheme they link everything together significant numbering systems so uh down below here we have some symbols uh some basic power symbols and and our first one there is a a fused disconnect switch and beside it we have a little auxiliary contact because we need to know whether that switch is closed or open and the the circuit for our controls need to know that's happened and many of you have hmi systems now that give us a lot of information we we can do a lot of troubleshooting from hi and hmi system now don't you have to get a meter out and a lot of them tell you exactly what's wrong and so we have auxiliary contacts to give us information say yeah that switch is closed uh does that mean the fuses are good no it doesn't mean that but it just means that it is closed and and that's important to know because especially in production lines now where uh a lot of machines have two disconnects for a motor they may have a disconnect back in the motor control center uh on the mcc bucket and they may have another disconnect uh non-fused disconnect out at right next to the motor so we can lock it out right next to the motor uh and we know nobody's gonna turn it on on us so when i have auxiliary disconnects in there that tells a circuitry that they're open it will not let somebody close the motor starter contactor and put power out to that disconnect next to that motor i'm working on because i do not want to turn that disconnect on and have that motor come on lots of bad things can happen so we have all of these contacts to give us that information and they'll be on your on your power drawings but they'll probably have numbers on them so when we start looking at our auxiliary contact here there'll be a number that tells me where those wires go to another page to another print uh something to let me know how that is hooked into the control circuit uh our next uh symbol over here is a non-fused disconnect switch so this would be one like next to that motor the first one might have been in the disconnect this one could be right next to the motor i don't need to fuse it because i already have the over current protection in the motor starter bucket and also has an auxiliary so that i know when it's open or closed these typically are lights that show up on an hmi system as soon as the operator looks he can say oh we didn't you know they worked on it they unlocked it but they must have forgot to close it so the reason it won't start up is because the disconnect switch is open so our next symbol is a contact this is a three-phase contactor and uh we use contactors for lots of different things uh lighting uh some contactors in front of vfds we just use them all over the place because they can handle current so this symbol here is just showing me uh a three-phase contactor the last one back to our overloads uh are letting us know that uh we have three overloads they're usually drawn on the power print and that may tell you what they are on the print as far as what type they are and or what their current is but on a power print we get a lot of that information so as we see these in that power drawing we need to know what they are and how they function and how they work when we get into controls boy we get lots of different symbols that mean lots of different things and some uh we're more familiar with than others but our first symbol is a normally open push button so what we know is our abbreviation is no we've probably most of you have probably worked with that for a long time tells us it's normally open so and it's a momentary push button that means when i push it down i let it go it's going to come right back and open up again i think a lot of you you know when i think of a normally open push button like that i think of a green start button for a motor that's kind of typical so i know that as this being in part of my path no power is going to go through here i don't have a path until i close that button just like we do in a start station so our next one is a normally closed push button so back to nc for normally closed it's also momentary this would be that stop button on that machine or on a particular motor so when i push it in i have i do not have a path for current flow this is also a button or a similar button that we would use for an emergency stop and usually typically have a mushroom type head on those and so depending on how new your machinery is you may have an entire print that just shows the emergency uh shutdown system on that machine so there'll be lots of emergency relays and things like that to turn off power uh i guess the thing i would tell people is just be you know you don't turn a machine off with an e-stop unless it's an emergency you turn the machine off with a stop button so when i hit a stop button that lets the machine go through its normal shutdown sequence if i hit an e-stop it doesn't it stops everything almost all the time anyhow depending on the machine and so i need to know that okay i need to know what stops and what doesn't so back to knowing your equipment spending time there uh our next symbol is a normally open limit switch everybody works with these see them all the time and uh but somehow we get confused on uh some of our symbols and a lot of our symbols uh are gravity driven so when i look at this symbol gravity keeps it open gravity keeps that open so i need something to push it whether that's a door or an arm on a piece of machinery or whatever that is to close that contacts so current can flow through there okay and when we when we get into uh limit switches we've got some that confuse people on a regular basis so this is the one we were just talking about normally open and so we've got to push it to close and then we've got to normally close and again gravity is keeping that close let let the path of current flow through there and i need something to push it open to open up that circuit now the two on the next block down here are the confusing ones because this one looks like a normally closed and this one looks like a normally open but it's not this is a normally open switch held closed uh you might see uh maybe a guard has to be in place and there's a limit switch that the guard sits on to make sure that it's there for us to run a gate on the back of a machine or something like that that has to be closed or the machine doesn't run so i would have a normally open limit switch held closed by the gate okay so what happens i found on these is when people in a hurry troubleshooting this looks like a normally closed if i don't pay attention to what side that line is on that circle okay uh and the same way with the next one this guy right here is that one you know are the lights on in your refrigerator when the doors closed well guess what this is the little guy that makes all that happen so when i close the door it pushes the limit switch and opens up and turns the lights off at least i think it does anyhow and when i open the refrigerator door it closes and turn the lights on so what i would tell you is that when you're looking at a drawing these are sometimes confusing and make sure that you realize what side that line is on that circle or you can make a mistake and it could cost you a lot of time troubleshooting and a lot of down time and nobody likes downtime this is looking at it inside of a limit switch in iec and one of the things that the iec people do is they number their contacts 13 14 21 and 22. we're going to talk about those numbers a little bit later and they also basically have back to our abbreviations is that we have that normally open and normally closed all right let's get back to our flow switch here uh or a float switch we people have a lot of float switches uh in tanks and those kind of things and uh some of those switches have normally open and normally closed contacts in the not available our next one is actually a pilot light it's a load it's one of those loads that we have and they're drawn typically that way and a lot of them circle and the letter in the center indicates the color of the lens so in this particular case we have a green lens on that pilot light uh our other circle usually indicates a coil in this case it has a cr in it to stand for control relay sometimes they just put r for relay sometimes it has t for timer but it is coil and that's typical in our ladder diagrams as well our next symbol is a solenoid uh we use lots of solenoids on machinery uh for air valves hydraulic valves and they're letting things you know control cylinders and those kind of things to go in and out and so this is the load and this would be at the right side of that drawing uh our next symbol is just a relay contact and it's a normally open set of contacts the next one is a normally closed set of contacts and these will be on the drawings okay so one of the things you have to understand is that prints are drawn in the de-energized state so that means without power on them that means like having a relay in your hand if it says it's normally open there's no power applied and this is very important to you because you have to understand that if you're troubleshooting a machine more than likely you have the power turned on to that machine you're troubleshooting it and so what the drawing shows is normally open could be closed that's understanding your machine and how it works and when it does things so that you know yep it's it's normally open and it shows open on the print but right now it's closed because that cylinder is pushed out hit that limit switch or whatever that contact's on so it's very important to know uh what they all mean and to understand they're drawn in the de-energized state when i look at that print i can only think of one or two times i've ever ran across a print that was not drawn in a de-energized mode that's very that's not normal this is a ladder diagram this is something that we uh typically use on machinery and so we uh we have to know how we use this drawing how it helps us and and this is back to this is that drawing where it doesn't really show us where anything's at it just shows us the path the current has to take to make something work so uh it may have termination points on it and those termination uh symbols may be different from your different drawings it may be a square it might be a triangle with a number in it it's hard to say but you'll have to look at your prints and figure that out now a ladder diagram it would call it a ladder because we have rails on the side each side we have a rail and then we have rungs across since we call it a ladder diagram and so a ladder diagram is read from top to bottom that's that's how the sequence of the machine works and and the path is from left to right okay so as you can see we have numbers on both sides over here we have red numbers and these are the rung numbers so drawings can have many rungs hundreds of runs it depends on how big that drawing is we're using these to help us locate things these are locator numbers for us if you don't have rung numbers it's more difficult the numbers over here on the right side of the diagram are associated with this load right here and this is a coil but it's the motor starter coil uh you may have numbers associated with that motor or not it's hard to say but in this case what we know is that when this coil is energized these real these contacts on this motor starter all change state so when it comes to the controls so here it says that i have a contact on rung two here's rung two and here it is it's a normally open contact the next one on rung three with a line under it the line under the number means that i'm looking for a normally closed contact associated with this coil so here it is ms normally closed turns the light on and four is on rung four so you could have lots of numbers over here if this was a relay instead of a motor starter you may have five six sets of contacts and what they're going to try to tell you is is all the runs that those contacts are on so i can go to the rung and i can then easily find the ms if that's the case or a number associated with this motor starter helps me troubleshoot much faster so the other thing here back to our path to current flows is when i look at drawings right now i only have one path in this whole drawing and that is the green light and so if i have power on my my control transformer up here my green light should come on so that's one of the things you know about machinery is that when i turn on the power should should i have lights should i not have lights that's why you have to spend time with your equipment to make sure you understand what it does and how it does it so that you should know when you're supposed to have lights and don't have lights so all of these all of these things help us with using a print and identifying where things are to talk a little bit about iec prints a lot of you probably have european equipment and so i guess a couple things i would say about european equipment or just because you have european motor starters and limit switches and relays did not necessarily mean the machine came from europe uh so it makes a big difference uh because the europeans think a little bit different than we do and why are different than we do so if it's a machine that was built in the united states with european equipment it may not be the same why wired the same way i'm about to show you but if it came from europe uh they're they're very uh meticulous over there uh and they do things to help you understand and again troubleshoot faster so when i get to a european print uh we kind of have the opposite thing going for us is that they read from left to right top to bottom and their equipment typically has a number so if i look at this this block right here this square uh i've got a number and if you look at that number here's that number right over here so what they're trying to tell me is is the print group that i'm in so a7 because this obviously has lots it has a b print group and a c print group this particular one is an a it's telling me the page so the second set of numbers zero two tells me that i'm on the second page of that print group so if you look over here in the corner you can see that we have an arrow that says okay the print before this is group a7-01 and the print after this is a7-03 and the print i'm on is a7-2 and there's 79 pages so they're always trying to use their numbering system to get me someplace in iec drawing k stands for a contactor or relay now we'll talk about in a minute how i know which one is which then their rung number is the next number and i call it a space some people call it a rum uh but it's a space and this this would be a space here this could be you know rung one and so everything in there uh is going to be associated with that one and the last one is how many loads are in that rung so the space is quite wide and sometimes if i need more contacts for whatever that interlocking of the machine is i may have two squares over here and that number is going to be all the same except for the very last digit which would be a 2 associating it with that so when i have contacts off of it and i show them on a print someplace when i see the two or the one i know which relay it's associated with okay so quite often below the drawing they're going to have a drawing like this that associates where those contacts are now this one here this is just a a snippet out of a drawing but it's showing you that the space these are all on the same page because it doesn't take me any place and this is in rung one this is in rung three and this is in rung two or space one space two or space three it shows me where all these things are helps me identify and helps me find them so here's a symbol for an iec contact and most of their contactors allow you to have auxiliary contacts on the side so in the center here i'm looking at the main contact now one of the things with european drawings that's very important to understand is that if you notice all of the numbers up here are all odd numbers these are all odd numbers and that's the source of supply so when we start talking about european drawings the odd numbers is where the source is coming into it whether that's one limit switch to another limit switch or from one push button to another push button they're always using that's why they got those numbers on there and if you do it like that you always know where the source to that switch or push button should be so when it comes to their contactors uh a little bit different too one of the things with their contactors uh is if you notice here up on top get my pointer back out there for you is that they're single digit numbers and that tells me it's a contactor right away so when i looked at that print we had and we've seen those double digit numbers that was a relay single digit numbers are contactors so and here's my odds again guys one three and five two four and six this is the load side so load are the even numbers odd numbers are the source up here i have a1 and a2 for the coil that's always the numbers that they use a1 is always going to be the source of the feed to the coil and a2 is going to be that neutral or a negative okay so very important uh to understand that it helps you troubleshoot it helps you know where things are coming from so in this drawing here you can see that below our our square here it shows us that there's a one three and five that's showing us right though that that's power contacts that's the source to this contactor here's my load and this tells me that i have auxiliary contacts on it because they're double digit numbers and this one tells me that i have it on a different page this sets going into a different page so all these numbering schemes are there to take me someplace okay uh this contactor is for a motor but it is not a motor starter the only time we have a motor starter is when the overloads and main contacts are together i can have a contact and overload and when i get into european drawings typically the overloads are in a manual starter in most of their prints so i have a manual starter and in here i can turn it on and off and this is where my thermal overloads are so i have this then i have the contactor and then it goes out to the motor i don't have an overload like you're used to with nema motor starters where we have those set of overloads in there when it comes to those relays we talked about double digit numbers on our relays and that's the way our friend our iec stuff is but they're giving you information and if you notice here that across the top of this relay we've got 13 21 31 41 well the first digit is identifying which contact it is on the relay so here this is the first contact the next 21 is showing me that it's the second contact on the relay and so on so if you look down here we're going to three and we're going to four so they're indicating that the other thing is very important is to understand the numbers because if you look over here on the numbers okay we're going to find out that 3 and 4 mean normally open you see the numbers three and four on an iec push button that means it's normally open or on a contact block when you see one and two it means it's normally closed that's the system that they use to help identify where things are and what what what they are so instead of an abbreviation they're using a number to tell you the same thing so instead of an n o i'm getting a one and a two so if you look over here this particular one i've got 13 so i got three and a four and that tells me that's a normally open circuit even if i can't read it up here until that's what i know it is and the other one is a 21 and a 22 and i know one and two means that it's closed so i know it's the first contact on the relay the second contact the third and the fourth and over here is my coil a1 and a2 always that on european stuff symbols are a little bit different on our european stuff um but uh typically you can go online and you can find something that compares them their nomenclature is the same they're still using an nc and no but here's those numbers one and two three and four so this is the limit switch with those same numbers on it three and four open one and two close back to our little schedule up here and as we go through all of these our foot switches same thing we get we get this three and four one and two so that looks different than our symbols uh but uh you know if you come to one of our class and get a reference guide guess what you get these symbols uh our relay contacts again ncno same same thing but they're showing you there's nothing device so this is a relay contact and an iec relay it's how it's going to be drawn on the print here they're just putting a p in here to let us know that pressure now they're not we don't know whether it's water pressure or air pressure but it's pressure that operates makes this switch function and changes these contacts there's that mushroom head we talked about uh up front and a different symbol but there's that tells us right up front that that is a e-stop and we have our momentary push button here overload contacts they get a different set of numbers because they're special purpose but five and six means closed on special purpose uh contacts our contactor coil said a one and a two are always what makes it operate and a1 is always the source through the logic down to and a2 is always a negative uh or the neutral okay pilot light uh they're a little bit different on how they do theirs but they got a little x2 there and they will typically tell you what the color is but it is also an a1 and an a2 okay so here's a drawing that looks just like the drawing we looked at at the very beginning before when we got started our first ladder diagram but this is an iec ladder diagram so we're talking about left to right top to bottom and there's these spaces so this is space one or rung one space two space three and in a european drawing this particular contact right here is the overload contact so from that manual starter we talked about this is that contact so uh going to open up if you have an overload on that motor and shut this circuit down so then we go through our our stop button there's that one and two again and typically we don't show this line here but over here is the start button and this is the uh contact on the auxiliary contact and the motor start of the holding or the sealant circuit but they show it this way because that is the normal path the normal path is not through here because we know this is a momentary switch and so once we push the switch and close this and energize this coil this contact closes and that is the path here's the information on all the things associated with this contact so we have auxiliary contacts on here double digit numbers again showing us the first set the second set and the third set and then here it's showing us that the actual main contacts that's running the motor are way over in the group b set of prints hey marty this might give me a great segue into one of the questions we're getting um on the q and a line and that is that that coil that says a7-002 k11 um there's three components in that same rung that i have the exact same number why is that because they're all associated with contacts off of that back to when it is energized the state of all of those change and i need to know that so if you notice down below that square down here it says that this this set of contacts here is right here it's in rung one there it is that set right there this set here is on rung three there it is that's it that pilot light and this set is then rung two which is right here and so i'm i'm getting that so i know that they're all associated with the same number when i energize this right here all of these change state this entire group changes state gotcha and how do you feel about taking some more questions here about some schematics well i'm i'm good let's do it um so we're getting some really great questions coming in you all and um and by the way this is just an hour session as you know there's so much to cover there's so many different symbols and really um there there's only so much we can do in one hour so so highly recommend you take the full schematics class uh that we offer it's a whole two day class and lots of different schematics we're going to be getting through here but let's see if we can answer some schematic questions here while we have you for the next few minutes um what is um this is an interesting one is a float switch a limit switch what do you think no it's a switch but it's a float limit switch is one that we think of that sits out there and has an arm and something you know contacts that arm and opens or closes the switch that's a limit switch it is a switch it's just a different type of switch it's a float switch it's going to be in liquid a limit switch doesn't go in liquid got you um thank you so much for that question you all oh here's another great one that came in on the q a line for you marty um are there only nema and iec standards or are there more for instance in china or russia or other countries uh most of the other countries european countries somewhat use the iec standard but not all of them i i mean i can just tell you that the more you pay for engineering on a machine the better print you're going to get and a lot of people save money on on prints to get a cheaper machine yeah definitely it's a you realize when they're not following the standards uh when the when the symbols tend to just be whatever they want them to be um what should be the industry standard for symbols i think i can help kind of field that it really it really depends on which standards that that those folks are following in the in north america it's the nema the iec international but you can follow basically whatever standard it applies to you the application you're working on yeah as i was telling you in the beginning if it's wired in the united states and they're using european uh devices more than likely it's not going to be wired per the iec standards because very few people in the united states know and truly understand iec drawings definitely let's see [Music] um here's some really good yeah really good questions coming in thank you all very much we're going to try to take as many as we can in the next five minutes before the top of the hour and then we'll definitely honor your hour here together so thank you so much for being here um let's go with the whole idea of a schematic being drawn for electron flow versus hole flow is the schematic written for more electron flow or holes and does it not matter maybe i guess i'm not understood yeah h-o-l-e holes yeah holes uh i guess the the opposite uh flow of electrons so are we are they showing the flow of electrons or the flow of the space of electrons yeah i would i would agree too um it and i guess it really depends on which which uh what's the word which um mechanic you're using whether people believe it's the electrons flowing in the holes but that we'll leave that to the physicists and the scientists but for us we care about kind of the real world talk about current flow the path the current takes to energize the device yes absolutely um so what is a special purpose contactor i think we had mentioned that once uh yeah that that's something that that the europeans use and so that tells me that it's on an overload uh that's a special purpose contact or that manual motor starter those are special purpose contacts but all the other ones as we look at the ones with the single digits and the numbers we've used those are just your normal contacts are on relays and contactors so just by looking at the numbers i know exactly what it's on i know that the double digits are relays uh and i know that the single digits are a contact and they can handle you know large large amount of current gotcha um i think we got just a call time for a couple more of you sorry we can't get to all these questions but i'm going to try to summarize them the best i can uh let's see um for plcs uh so if we're looking at a schematic for a plc um is plc programming with ladder logic something worth learning and is it offered in tpc courses for for schematics well of course the answer isn't offered by tpc yes it is we do talk about plc ladder logic in our schematics class a lot of the older machines and when i say older still into the 2000s are still programmed in ladder logic a lot of the newer machines are not so yes you need to know it uh in plc ladder logic to be able to help you troubleshoot got you and um a couple of chatters about the whole whole idea between holes and electrons but yeah we're gonna we're gonna leave that one there because i think we're going to care about the election it really helps us to visualize from from the electron flow point of view um could a tool interlock let's see could it could a limit switch be used for a tool interlock sure yeah i would agree with that that would be whether it's normally closed or open it depends right yeah i mean you're just saying that if something's not in a position that you can't operate something and then when it's put in the right position then it will operate how do you determine uh a call a caller is asking about um how do you determine if a drawing we're looking at it was energized or not well uh if it's an if it's drawn in the energize mode it will say on the print but if it says nothing i'm going to assume that it's drawn in the de-energized mode good call excellent and we'll definitely be sending you that follow-up info that a few of you have requested um let's see i think the only other question we have is um is cad software so yeah computer-aided design software um is it helpful with this numbering of the diagram elements or not so much um is it helpful any numbering is helpful because you get so many drawings that have no numbering but most machine manufacturers i hate to say ones that are maybe more expensive you get a significant numbering system where every num every number on a wire means something and uh that again helps you troubleshoot you get into some machines that are so large that you need two or three plcs to make it run so back to my numbering scheme i can't have three wires with the same input or output they have to be numbered then certainly well thank you all so much for your questions uh got a lot of great ones coming in feel free to reach out to us again um marty if you want to flip to our number real quick so people can jot it down uh 847 808 4000. could call us back we can talk more schematics with you we love talking with you our instructors myself marty you might chat with us and uh sales tpctraining.com is our main uh email box for for you to chat with us as well so jot that down uh take a look at this where you're gonna see this again within two business days on our website and this recording will be available there for free and to watch back as many times as you like with your colleagues so thanks again look out for that email with the recording link and we will see you all soon thanks so much thanks everybody"

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"VideoID": "3201",

"Title": "Learn How To Read ELECTRICAL Drawings",

"URL": "https://www.youtube.com/watch?v=c4Yv\_VdUGSM",

"Keyword": "Electrical blueprint reading",

"Transcript": "in today's video we're going to take a close look at an electrical set of construction drawings I'm going to be talking about how I would approach reading and digesting these from start to finish by the end of this video you'll have a good understanding of what's included in the electrical drawings how to read the electrical drawings and how the electrical drawings tie into the rest of the building and the overall project so let's go all right if you're new to this video series or new to my channel I would highly suggest starting at the begin beginning of my drawing review video playlist as I include some great tips throughout each of the previous videos to help build on the skill set of reading and digesting construction drawings in these later videos so what's all included in the electrical drawings well the electrical drawing set will include all the power requirements in the building site power if it's a new building or a new electrical service electrical demolition if applicable to the project lighting plans and more telecommunication or data the fire alarm system and security systems are considered low voltage but are typically still combined in this overall electrical drawing set some Engineers might just designate different lettering for the low voltage series at the bottom right of each drawing sheet so we've got public and private utility companies that serve an electrical grid both above ground and below ground throughout our communities when you build a new building you need power so you've got got to connect into that grid well the grid is set up for high voltage to both accommodate customers needs as well as the fact that voltage is lost in transit over long distances and since voltage is lost these power companies install step up Transformers to transmit this power over these long distances so when the power makes its way across the grid to its final location at the project you'll also need a Step Down Transformer to bring that voltage back to the voltages required for that type of building use so if you see these that's what a typical Transformer looks like the utility company will install this Step Down Transformer near or on your site and hook it up to the grid then there is a circuit that connects from the Transformer and feeds into a meter where the power company tracks and builds usage this meter feeds into the building through a main electrical switch gear or switch board which is the central power station in the building usually in an El electrical room or an electrical closet from there depending on the size of the building you'll have any number of subpanels throughout the building these subpanels are fed by your main feeders and then there are subsequent Branch circuits throughout the building also each electrical drawing set should come with a set of specifications that we need to read further to understand the requirements of the electrical scope for this project the specifications we'll talk about material types installation requirements and more okay before before we jump into the specific details within this drawing set which are those zoomed in drawings within the plan set we're going to get a general understanding of the plans at a high level I always suggest this for all drawing sets starting with a zoomed out overview working ourselves further and further into those smaller details so we'll take a brief look at all the pages by skipping through the drawing set and reading the sheet names and then we'll focus on each page individually and finally we'll start to look at those smaller details so let's get going on on these plan sheets and see what they say all right here we're starting off with sheet e 0.1 electrical Legend abbreviations and connections which is going to be the most important page when learning how to read electrical drawings then we have e 0.2 lighting fixture schedule which explains the different types of light fixtures on this project after that we have e- 0.3 site plan electrical which is going to show us how power gets into the building from a new service or an existing service outside the building as well as any sight lighting such as our light posts and potentially security wiring for cameras on site Ed 1.1 is our first floor electrical demolition sheet e 1.1 is our first floor power and special systems which shows majority of our receptacles low voltage data Outlets mechanical or Plumbing equipment that needs power and more then then we have e 2.01 which is our first floor lighting throughout the space after that similarly is e 3.1 first floor fire alarm and security next is e4.1 Penthouse part plans electrical then e4.2 roof plan the next sheet in the series is e51 schematic power and fire alarm diagrams similarly E5 2 is the schematic telecommunications and security Riser diagrams then we have e6.1 e6.2 e6.5 and e6.5 which are all expanded electrical detail sheets then moving on to e7.52 which are our panel board schedules which shows us the circuit connection between each electrical panel in the building and that end receptical fixture or piece of equipment and last is e7.5 lighting controls schedule all right since that was our last page in the series let's go back to the beginning of these electrical drawings starting with e 0.1 the electrical Legend abbreviations and connections so with all these drawing pages I typically start with reading the general notes on each page so we're going to jump up here top left now note one reiterates that the electrical contractor is to read all the drawings for all the other trades which pretty much states there might be some specific power requirements elsewhere in this overall drawing set now moving down to note three this States the need to coordinate all mounting Heights with the architectural plans sections elevations and casework details and this last note we'll look at is note four which states to coordinate with walls that are to remain versus new walls Now new walls would get junction boxes for receptacles recessed in the overall wall assembly such as a wood framed wall light gauge framing or new masonry walls when you have existing masonry walls you're limited to surface mounting the conduit injunction boxes which is why they call out this wire mold below that we've got a chart for wire sizing based on the overall length of run for 20 amp circuits it also sizes the conduit for that wire to run in larger number wire sizing is actually smaller wire so the number 12 is smaller wire than the number four wire listed here okay we've got some more General notes including some notes on demolition but we're going to move over that to the symbol section now these symbols are showing lighting switches Outlets telecommunication conduit sound power fire alarm security and some miscellaneous symbols so let's dig into these so starting under lighting the first one shows a couple different symbols for differen size light fixtures followed by a symbol for strip lighting last it shows emergency power fixtures now newer or larger buildings have separate backup generators typically in the case of power loss while some other buildings could utilize fixtures with battery backup or a combination of the two and just to note there's likely going to be some specific emergency circuits throughout the building to maintain those Life Safety Systems so that people can safely navigate outside the building whether it's emergency lighting or exit signage okay moving down we have all of our switches which control lighting to the space through a manual wall switch or sensors that detect occupancy in the space to lower the overall power consumption for the building below that are our Outlets from the standard receptacle mounted 18 in above finished floor to receptacles with USB ports Incorporated special receptacles that serve non-standard equipment as well as an explanation of the Sy where we see dashed lines and slashes on each receptacle that we'll see later on in this plan moving up from there we've got Telecom symbols for all of our low voltage data Outlets telephone outlets audio visual outlets and wireless access points and wireless access points or denoted WAP that's what provides our Wi-Fi within the building then we've got actual conduit symbols and the conduit is the pipe that the actual wire gets gets pulled through a home run is a direct path from the end termination all the way back to the electrical panel if we keep going we've got additional power symbols such as our panel boards or where Motors are going to be serving equipment such as pumps we also have safety disconnects which is a manual disconnect to shut down a system in the event of an emergency as well as a couple other symbols next we have our fire alarm symbols with the first one being a pull station we also Al have duct type smoke detectors and if you recall from my mechanical drawing review video we talked about dampers as this relates to that now this smoke detector is mounted inside the duct and detects the presence of smoke from a fire being carried in the duct now when this happens the damper closes so that the air or more so fire isn't circulated throughout the building there are also Visual and voice alarms that trigger when this alarm goes off this system also connects to the sprinkler system with a flow switch so sprinkler heads are typically triggered by heat which shatters a small bulb in the sprinkler head that triggers the release of water and flow in the system or sometimes a chemical agent after a sprinkler triggers and releases the water the fire alarm flow switch will detect the flow of water in that main sprinkler pipe and send a relay signal back to the fire alarm panel to trigger those alerts throughout the building as well as the fire department last we'll look to top right at these symbols for security cameras card readers and door contacts which I'll explain a little bit more later on in this video and other than that we've got some abbreviations listed on this page that we can always reference back to but the symbols are going to be the bulk majority of explaining the systems and what we're going to see on the plan view of these drawings okay moving on to E 0.02 the lighting fixture schedule so each light has a fixture type designation which is just a letter or numbering system associated with each light fixture because they can't pack all the words for these fixtures on the actual drawings so if we wanted to know the light type size manufacturer model voltage wattage lamp type and mounting type we' cross reference with this page on the actual plan sets and if you want to go to the extra mile and know exactly what the light fixture looks like just copy the model number from this chart into Google and it'll give you a good idea of what to expect before the light fixture gets to the site also it's good practice for the electrical contractor to double check that the lighting system is coordinated with the ceiling grid system because ceiling grid systems can come in different sizes and lights are designed for different grid systems the design team should have taken care of this effort but it's worth checking and I'll mention why specifically as it relates to this later on in this drawing video all right there are a few more General notes on this page but we're going to keep this train moving here we have e 0.3 our sight plan electrical now if I zoom in on this area I can see that there was an existing Transformer that is being removed based on the RX or remove existing note it likely needs to be replaced because the old Transformer was sized smaller for a smaller application but with all the upgrades that this building is getting the Transformer also needs to be upsized and replaced to accommodate the increased needs so the new Transformer is going to sit close by and we see where it's going into the building at this electrical room also bottom left on this page we have notes about sight lighting so the first one is S1 and this is a dsx1 fixture which is a light pole and if I move over to the right side of this page we can see three of these along the sidewalk to help eluminate this entrance okay on to Ed 1.1 which is our electrical demolition plan now I'm not going to go over this page in depth if you've watched my previous videos the general line of thought is that if there is a typical dash line it indicates demolition solid lines typically are meant to show items that are existing to remain but we got to read all the notes on this page and just take a double check at all these details just to make sure but other than that we're going to move on to E 1.1 our first floor power and special systems so let's jump top right on this page there are all all kinds of drawing notes with circles that actually relate back to this specific page looking at note one it says to mount receptacles of 4 in above the baseboard heater now the standard code height at least in the United States for a receptacle is 18 in above finished floor also noted on our Legend page if you recall which is why they called out this specific height since it's non-typical okay let's move over to the left side of this page and zoom in over these two rooms we're going to tackle the layout of this room and what these symbols mean by pulling up our symbol chart so we can see here that this W stands for wireless access point this a stands for admin data drop the m stands for polycom ceiling microphone makes sense because this is a conference room and then we have a camera with this note 18 so let's go take a look at this note 18 so this note 18 says that it's a camera for that same polycom system which makes sense because it's the conference room and finally we have a handful of data Outlets receptacles and some other symbols now next to these receptacles we've actually got some numbers such as C13 and C15 so these actually tells which circuit they're on and this is going to take us to our panel board schedule so all of this power originates from an electrical panel in the building so I'm going to quickly flip over to E7 .2 panel board schedule so if I zoom in on this page I can see this C13 and this C15 circuit which gives me all the information I need on these individual circuits now if I look up here it tells me which panel board this circuit ties into now this says this is Branch panel C which is located in room electric 220b so let's go back to that power drawing we were just on and look at see if we can find this Electric 220b room okay it looks like we found it so these circuits that go from the conference room lead back to this 220b electrical room and this panel board within this electrical room but you'll notice that there's not a line drawn between the two showing the circuit or conduit run from the panel to receptacle now unlike duct work or Plumbing piping that is physically drawn on the plans larger projects don't always show all these Connections in plan view which is why we have to reference back to the electrical panel board schedule the electrician will plan and coordinate their runs of conduit from the panels throughout the space so the space we're looking at actually has a bubble around it with the note detail 2 on E 1.1 well we're already on drawing e 1.1 so let's go take a look at detail to so we can now Trace where all the power originates from and ends at in the building by using these circuit numbers and the panel schedule and the rest of this page is it's going to show the same thing over and over with each circuit originating from a particular panel board so we're going to move on to E 2.1 first floor lighting all right I'm going to zoom in on the left side of that page again at the same area we were looking at on the previous power plan and we can see the lighting that is going to be serving these two rooms so if we recall from our Legend these symbols are for 1tx 4T fixtures as well as 2T X 4ft fixtures the a a e l and l e are fixture types if we recall from our lighting fixture schedule so let's take a quick flip back to that e 0.2 lighting fixture schedule and we see the specific lighting fixtures intended for this room now looking at the E this just indicates that the light comes with an integral emergency battery all right I know we're jumping around a bit but this is how we gather all the information to make sense so we're going to go back to e 2.1 first floor lighting and on the bottom right of each fixture we see L4 so this references back to the panel that powers these lights just like our receptacles did so we're going to flip forward to e 7.1 another panel board schedule drawing and we're going to zoom in on this Branch panel and it listed L for lighting we see L4 listed as well so we know that this panel feeds the lights in that that room this panel board is also located in electric room 220b okay so let's wrap this back up on E 2.1 first floor lighting all right there is also these OS which stands for occupancy sensor which flips on the light automatically when a user or occupant enters the space we also have manual switches in this room listed as S3 LV and S4 LV so quickly pulling up the Legend page we can confirm that this is a manual switch in the room on the wall and adjacent to the space we have our exit signage as well what this drawing doesn't show is the architectural reflected ceiling plan as it relates to the lighting which would be nice so that we can easily see what type of ceiling it is what other overhead fixtures would be installed in that ceiling such as HVAC grills to better coordinate the overall layout of the space and if you recall this also is why I mentioned earlier about confirming grid type since it's not shown on here I think we should do a double check at a future date all right zooming back out there are all kinds of lighting fixtures throughout we just have to use our symbols our lighting fixture schedule and our panel schedules to figure out how they're all connected and what exactly they are and the next page is e 3.1 first floor fire alarm and security so again using our symbol Legend we can see a ceiling mounted fire alarm voice speaker with strobe that will trigger in the event of a fire right outside the space we see a fire alarm Pull Station we also see a couple security systems so let's reference our security symbols well we see our cameras and then we see this box that says CR well this CR stands for our card reader so when the card reader is swiped outside the building it sends a signal to unlatch the door we also have door contacts the door contact consists of a little sensor mounted on the door frame and a magnet mounted on the door itself now this sends a signal back to the security monitoring system that the door is either open or closed now in a highly secure building it'll notify a security team if the door's been propped open longer than it should be all right it looks like the rest of this page is going to have the same information repeated throughout so we can move forward to e4.1 Penthouse part plans now this is going to show us mechanical equipment in these spaces to better understand power requirements for that mechanical equipment as it sits in the space then we have e4.2 which is the roof plan so we've got mechanical equipment that sits on the roof which tells the electrician that they'll need to run power through the roof assembly to feed this rooftop equipment so if we keep going to the next sheet we've got e 5.1 schematic power and fire alarm Riser diagrams now if I zoom in on the Power Riser diagram this gives us a simple layout of how the power enters the building from the Transformer to the meter to the main switch gear or switch board from there it shows a simple oneline diagram of how the rest of the branch panels are fed in relationship to that main switch gear or switchboard on the project and if you recall from earlier of us looking briefly at the panelboard schedule for our receptacles and our lighting we actually see this panel board L and C among the rest of these panel boards and right below that we have the same diagram for the fire alarm system so moving on from this sheet to the next sheet which is e 5.2 Telecom and security Riser diagrams we can briefly zoom in and see the same layout for those specific systems all right on to e6.1 we have our electrical details and looking at this detail 6 we see how we're supposed to install conduit underground for our Li PS moving over to detail 10 we see grounding requirements at the Transformer finally on detail 4 it shows us exactly how the conduit is intended to run and enter that pad so this tells us a little bit more about sequencing of the work and everything that needs to happen before power actually goes live in that Transformer moving on to e6.2 which is just more electrical details in our conference room from earlier we were called called The Letter A for the administration drop and on this page I'm going to zoom in on this detail where we can clearly see what's intended for an Administration drop which includes both receptacles and data Outlets down on detail 13 we've got our light pole base detail so I'm going to skip over e6.2 and e6.5 electrical details continued because these are just similar Pages expanding on those close-up details and we'll just have to look at those when we return to them and then we're going to move on to e7.5 point1 panel board schedules so on this page each of these charts relate back to specific panel boards and I'm going to zoom in top left and look at this switchboard mdp it gives us information on the switchboard itself such as voltage phasing wiring mounting and enclosure type then lower on this switchboard we see four lines C and C1 L M and R via TR so this main switchboard feeds all our other Branch panels on this page and the next page so if we were to go to Branch panel M we can see right at the top that it's fed from this mdp if we go over to L it says the same thing so now we can trace power from an end light fixture or receptacle back to its panel board and then back to the main switch board which goes back to the Transformer outside the building which ties into the overall electrical grid completing the whole circuit so e7.3 the next sheet is going to be the same exact thing with additional Branch panels and finally on e7.3 we have our lighting control schedule so right at the top of this page we see our conference room that we were originally looking at which had those manual wall switches now this sheet is going to explain how the switching is supposed to be set up and controlled in conjunction with our sensors in the space all right that's enough for today hopefully you've got a decent understanding now of how to read and digest electrical drawings but if you do have a comment or a question feel free to drop it below which reminds me I've got to go pay my electrical bill so as always be better build better and bye for now a"

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"VideoID": "3202",

"Title": "How to read an electrical diagram Lesson #1",

"URL": "https://www.youtube.com/watch?v=KbvM5Tkc-UA",

"Keyword": "Electrical blueprint reading",

"Transcript": "reading an electrical diagram they can be pretty simple or they can be complex and they've got a language of their own now we normally talk and we use words as you read here for the word resistor chassis ground electronic motor RF used when I say those words something comes to mind you have an image of what's going on well in the electrical diagram they don't use words they use symbols to say the same thing so we have to understand the language of symbols the language of diagrams always include symbols words numbers lines all of this stuff is on there and it's all for the purpose of helping us follow the map now we're going to talk more about symbols as we go along in each one of these sessions but when you're looking at electric 'old aya Graham remember you're looking at a map not a street map but a map of electrical current trying to find this path from positive to negative now this is a map of Missouri I happen to live in Missouri in Springfield I have a friend that lives in Kansas City and if we both wanted to go on a trip and meet in st. Louis I would take this road and he would take the other road and we would meet in st. Louis now if this were an electrical map this would be the power side and this would be the ground side and st. Louis would be the load now the power when you're color coding the power road that is directly to the load is always colored red and the ground Road that is directly to the load is always colored green that's true on our electrical diagrams so on the map or on a diagram first thing to do is locate the load now load is a device something that consumes the power it does work like a light bulb a blower motor a coil the second thing is to do is locate the power source or the fuse that sin's feeds the power and the third is to locate the ground source where the ground originates an electrical diagram it looked a lot like this where first would locate the load now remember this is a map so this is your destination where you want to end up you'd want to have the starting point for the power find the fuses in the PowerPoint you'd want to find the ground source the place where the ground originates that's the first things to locate now you notice that they're both going to be pointing towards the destination or the load so let's read the electrical diagram and see how this fits together in an electrical diagram here's the three things that we locate before we start looking at the map notice the word up your battery now that means the source of this power is the battery now you know battery is not turned on it doesn't have a switch there's power in that battery at all times so we're gonna color that red because red means it has power at all times now this leads us to our first rule voltage and ground always stop at an open circuit now here this switch is open so since it is an open circuit that red or that power is going to stop right there always now on the ground side it has ground all the time because it says g105 that means it is a body ground source we're gonna color that green because green means it has ground at all times it's not turned on yet that is bolted down to the frame it has ground now it confirms our rule that voltage is ground always stop at an open now the next power source over here the word says start run that means you only have power if you have switched to the start or switched to the run position so that is a switched power so we're gonna color is orange anything in orange means it's only has power when it is switched on or turned on now look down here at the bottom you see this dotted square this is the PCM if that happened to be a solid square instead of dotted that would mean it is all inclusive everything is in there but the fact that it's dotted means that there's actually more in this PCM that will look yet it is only displaying what we're concerned about in this diagram now we look down here we see that the PCM supplies ground for the fuel pump relay control so we're gonna color this yellow now yellow means it only has ground when it's switched on if you notice on the right the red is power at all times it is not switched on and the green is ground at all times it is not switched on the something has to be switched on the power side with colored orange or if it has to be switched on on the ground side will always color it yellow now this up here is an electromagnet when electromagnet has power and ground it activates and when it activates it sends that where magnetic pulse across and it closes the switch since that switch is not open it it's now closed power can travel it travels down to the fuel pump it finds its ground and the fuel pump consumes the power now here's your next assignment find this diagram on my website for this particular video I'll post these videos on my website and with each one I'm going to post the blank diagram so that you can color it in it'll be downloaded as a PDF file print it out and then color it in now here's what I want you to do go get yourself 5 colored markers you're gonna need them as we go along don't forget to do this our series is going to continue with lesson number two watch for it in the next video and don't forget go get those markers"

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"VideoID": "3203",

"Title": "Explaining How To Use Electrical Blueprints In The Real World",

"URL": "https://www.youtube.com/watch?v=QthiVaKLfEI",

"Keyword": "Electrical blueprint reading",

"Transcript": "[Music] all right everyone welcome back to the channel thanks for stopping by I appreciate that a lot so today I want to go over blueprints how it looks how it transfers from on the page to real life so it's not I mean it's a at work video but it's kind of like a tutorial so anyways you look at this pink line right here this is the emergency circuit which also stands for the 12 3 wire so I ran basically all this this morning well throughout the day but I started here on this pink line and as you can see that there's coil over there for the for the exercise right there by the stairwell and then there's a light so the circle right here is the exit that's an exit sign marker and then all these other squares are the lights so wherever there's a light that's where I'm leaving a coil of wire for the drop ceiling and then someone marked these out on the floor so that was nice so I'm just going around and I've been shooting the back the back twos on the ceiling which looks like that right there and then just popping the wire inside of that so as you can see I got the exit sign from right over there kind of hard to see probably but then I got the light the light the light light another light another light another light so that's the first row right there so those are in 12 three right there for the emergency power and then these other two on the right side right here these two yellow ones or just a 12-2 wire so I'm just following the print for what is going it's got emergency I'm doing 12 3 if I'm Duke of its regular I'm doing 12 2 and then as you can see I got a pink line right here going with a yellow in the yellow so this one is going to the exit sign right there that's where we're standing so we got these strawberry here there's four of them this one is the last emergency right there so that's going to line yourself up in the right direction [Music] going in the right direction big line two yellow ones yellow and then yellow so you can also see the colons on here which makes it easier if you're having trouble so you got the little colons right here here's a little symbol for a column there's another column so you know in between this column and the wall there's going to be a light right there between this column and this column there's a light right there so if you just follow that and look at it there it's gonna be right there so how could that make sense but just kind of what I was working on today so as you can see right here but just go for emergency power so I'll just go around to show you that's kind of just one do I want to show you on the how-to or how blueprints work to real life just kind of basic with the lights and the negative signs and then the number engine to power 12 3 and then the regular 12 - but basically yesterday I only had the this row right here going all the way down there and then today I basically finished all of all of this whole floor center over the ramp coming up a parking garage so I got both of these rows done all the way down and then all the way down here I'm gonna drop this print off real quick these ones over there [Music] [Music] one I got pretty much all of this done for the most part today I shot the Mac tubes yesterday for the most part and then I just wonder outputting the wire in today so there is another row that has to be done there there's a bunch of stuff there and then this row right here and then of course over the over the ramp I think there's one two three four five over the ramp so down there but there's a few lights over the ramp that we have to get later for the most part I'm getting pretty close to being done except for that part so I might try to get this tomorrow and then I do have here too right there so that's what I've been working on hopefully you guys enjoy this hopefully that helps me out a little bit for the blueprints hopefully you guys have a great rest of your day thanks for stopping by don't forget to check out the description for everything else you need if you enjoy this video make sure to hit the like button and subscribe I appreciate that it helped me out and yep that'll do it god bless have an awesome recipe today and hit the notification bar than that thanks guys you sound bless"

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"VideoID": "3211",

"Title": "Floor Plan Basics - Using Grid Paper and Electrical Symbols",

"URL": "https://www.youtube.com/watch?v=6MZsPTZ4SyA",

"Keyword": "Electrical blueprint reading",

"Transcript": "to create a floor plan drawing of a room start by measuring the room walls along the floor measure the doors and the windows measure the distance from walls and between features also make note of electrical switches electrical outlets and the lights now transfer your measurements to grid paper this is an overhead view of the room and i'm using each box to represent one foot this wall is 15 feet wide so i counted boxes 1 2 3 all the way over to 15 the door swings into the room and the window is next to it here's the light switch the outlet receptacle and the ceiling light use this same technique to finish your room if you want to get more advanced you can make the walls thicker and you can indicate which switches control specific lights and that's the beginning of a simple floor plan"

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"VideoID": "3218",

"Title": "Basic Electrical - Ladder diagrams",

"URL": "https://www.youtube.com/watch?v=6S600DO6DpQ",

"Keyword": "Electrical blueprint reading",

"Transcript": "all right welcome back to another training video in this video what I'd like to do is talk about line diagrams or ladder schematics depending on what you want to call them they're kind of interchangeable whether they're diagrams or schematics I've talked to some people that call them one way and then people call them another remember the the type of circuits were working with in this module are gonna be some kind of industrial control circuits so ladder diagrams are the kind of main way that we try to convey those circuits to each other or give us the ability to look at those circuits to do some troubleshooting now like I said it's sometimes called the ladder diagram and that's because how this circuit is going to be set up is it's gonna be multiple rungs kind of dependent on each other or sometimes they're not totally dependent on each other but they will have the same power source and it would probably be inside the same electrical box so with any power or any control circuit we're gonna need power coming in and what we're gonna do is we're going to take that incoming power and we're probably gonna run it through a transformer because most control circuits are only going to run at about 24 12 + or 120 volts depending on where you work and what those people you know like so like I said more than likely you're gonna have 480 volts coming in and we need to bring it down so in our case we're gonna have 120 volts coming in and we're gonna bring it down to 24 or 12 so let's go ahead and draw that transformer up because that's where everything starts so as you remember a transformer is going to be multiple bumps or coils and put together and they're gonna be a this will be your secondary side and then we're gonna have our primary side right here okay this one will go up this will go up and this one up here is going to be our 120 incoming voltage on a primary side and we're gonna have 24 volts on our secondary alright so we've got our input power and that's kind of all we're gonna have for a transformer and we're gonna get a little bit more into this power side in the motor controls and stuff like that because there's little bit more happening up here but right now we're just kind of sticking to some very basic ladder diagrams okay so usually it'll come over and then we're gonna start our sides so these are going to go all the way down and try to draw them as straight as possible and we can have multiple runs inside this section the also what we're gonna do is we're gonna need to put in a breaker or a fuse depending on what the engineer has designed so I like to put them here on this first run they usually will just be drawn as a block with a I like to put them on either you'll have two amps above it in the middle of it to the side we're gonna go ahead and put two amps inside of it because you get to draw it so we get to do it that way so we're gonna have our rating for our breaker right here and then we're going to go ahead and we're going to start building circuits based on that so every circuit we build will be under this breaker so if this breaker pops all these circuits will go back where all these circuits will no longer have power I should say now again we're using a 2 amp breaker because most of our circuits we're using are gonna be pretty low voltage or low draw so coming over what we're gonna do is we're gonna draw our first our first line so our first one we're just gonna have a switch and this would just be a regular switch and we're going to get more into different types of switches here in just a second but for right now this would be the switch that I would probably say we're going to use the most we're gonna come over and I want to do multiple lights okay and then this is going to go over back to our our Neutral now if I wanted to have multiple circuits I could come down here and start drawing another another circuit I can put a switch right here and we can have another circuit and then we can also let's say we'll put a siren or something like that or that speaker over here going back okay so like I said multiple circuits keep going on down we're gonna start by doing one line and then we're gonna build onto it and yes one line could you know operate another line depending on how we have that wired together so when we get into relays we're really going to start seeing multiple lines happen now one very important thing is right from this point all the way down all the way on these lines all the way up this this switch all has power right now so there's 24 volts of potential power on this side at all times unless the switch clicks over or until the switch clicks over it doesn't move to the other side so once that switch goes all this has power so that kind of kind of concludes everything that we need to know right now about ladder diagrams like I said we're gonna go ahead and we're gonna get into them way more but if you guys have any questions or need any help please let me know like I said we're gonna kind of go into these we're gonna do some simple ones and we're going to build on - I'm gonna it's gonna try to explain that as best I possibly can as we go along so let me know if you need help let's go ahead and get started"

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"VideoID": "3225",

"Title": "Transition from Prints to Install! #electrical #blueprint #installation",

"URL": "https://www.youtube.com/watch?v=qw5C6aof\_Rc",

"Keyword": "Electrical blueprint reading",

"Transcript": "have you ever wondered how this gets laid out precisely where it's supposed to be donate a minute at a time and I'll explain find a reference point my office and count how many dog doors is in between each one once the hard part of laying them out is done I like to go through on the wall and put a piece of duct tape at each one labeling what panel it comes from and what circuit it is that's what it'll look like once you have them all labeled then you can start pulling your wire once you've got your wire in then all you've got to do is terminate this is helpful make sure to go smash that like And subscribe button please and let me know in the comments have a great day"

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{

"VideoID": "3231",

"Title": "Cracking the code: Begineer&#39;s Guide to Electrical Drawings - Part 2.2",

"URL": "https://www.youtube.com/watch?v=-ZLPHcb5KCQ",

"Keyword": "Electrical blueprint reading",

"Transcript": "a rung can be defined as a complete path from L1 to L2 that contains a load this diagram shows the markings of each rung in a line diagram with three separate rungs numerical cross-referencing is used in conjunction with wrong numbering to help us locate auxiliary contacts controlled by a coil"

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"VideoID": "3256",

"Title": "TRAINING THURSDAY: Blueprint Reading for Construction Projects",

"URL": "https://www.youtube.com/watch?v=s9MBDCToPNw",

"Keyword": "Electrical blueprint reading",

"Transcript": "[Music] celebrate training times come on it's a celebration oh god of training time hi everyone and welcome training Thursday for today Thursday August the 29th 20124 I'm Jordan bman vice president Communications for the independent contractors and businesses Association the mighty icba yes joins us always by Carrie vital manager member services for icba Vital by name vital by Nature Carrie that didn't just roll off your tongue is that new title think about that yes um I I am happy say I got promoted this week girl boss right uh so yeah I did get promoted this week so I am now the manager of member services for icba um so I am doing not just training and apprenticeship and Workforce Development but also yeah everything in the kind of member services field yes so uh any questions about the services we offer you as a member yeah send them to member services at ICBC all right well congratulations that's awesome news um and uh yeah very exciting for sure okay thank you um training training training I do want to talk a little bit about the big political news yesterday because man such great news I woke up this morning and I legit thought am I hung over but no because I like I mean I mean Chris and I had one shot of uh Terry Bradshaw bourbon in celebration I love it aming but you know just the gness that was like strut into work like I'm Ric Flair woo on Twitter I'm like happy keyboard Warrior God I hear you were on the news yesterday on the news such a great day for free enterprisers maybe the best day for BC free enterprisers since Christy Clark's comeback election win in 2013 for years it feels like we can't have any nice things on our side of the fans and now we do BC United is down tools they're uh joining uh the BC conservatives and finally there is just one one opponent to the NDP we can rally around the BC consider and defeat David E the NDP and their like brutal policies in on the economy on affordability on Health Care on Public Safety hey guys I'm going you on a secret political message provinces do just a few things they manage the economy they manage government spending they run Health Care they you know run police and public safety issues um those sound like big deals and you know they help on the housing F all of those the NDP have abject failures so if uh all those things are failing maybe maybe it's the guy in charge so let's dump Dave yeah so yeah that that was an interesting thing to get uh showing up Suddenly on my cell phone I was in a board meeting yesterday and suddenly my phone goes I was like okay yep and it was the news so yeah that that was quite a little surprise uh midafternoon yesterday but yeah we obviously at icba are very excited about this news uh moving forward uh as the apprenticeship manager for IBA uh the ndp's policies have screwed with my apprentices and I do not like it exactly so yeah and and there's still tunnel vision like let's take apprentices great great topic my we have a aging Workforce and a historic shortage in trades workers yes which then you know means that you have to pay more for labor which means that housing costs more y so what's the way to solve this oh I know more trades workers so what do we do we limit educ ational possibilities to the narrowest field we you know the NDP gives sweetheart deals to the unions trading schools to put in their very narrow PE you know piece of the pie 15% of the workforce we have 85% we do uh they don't make it easier for folks from outside lur Mainland to do this stuff they don't adopt things like U PVC Pacific vocational colleges done with 3D printing of pipes and and letting people work from home we should be doing everything we can to get more red seals in the system NP don't nope so they don't so yeah it it's not been a good past few years for my uh poor apprentices but we we have light at the end of the tunnel hopefully on a train hopefully good yes that's right so yeah we're moving forward and we are very happy heard icba so watch icba doca for all sorts of fun things I've never been so happy to have to rip up an election plan and rewrite it on fly was the best so there you go okay uh election plans really are basically blueprints for communications and I'm going to start doing weird I love how you got there Cy segu from one to the other and Carrie I can't help but noticing that blueprint reading is one of the skills we teach we teach at IC training right blueprint reading for construction projects uh four sessions over four weeks three hours per session starting on September the 19th so it's 12 hours in total uh set up as a live instructor online training course like we normally do 3 hours like I said once per week uh you're going to learn the functions of different plan views elevations sections details and schedules presented on architectural structural mechanical electrical and plumbing me drawings uh you'll practice identifying standard construction Graphics interpretating interpretating interpr killing it inter works with words professionally that's a really bad sign interpreting specifications and key terminology relevant to interpreting graphical and written construction documents so uh we would consider this course a bit of an intermediate course we do have a more introduction to blueprint reading course as well too which you can find on our website um but we do want you to have a basic understanding of Concepts and terminology and construction okay I.C courses for all our courses but click the link below for this one blueprint reading for construction projects uh yes so that um I've recently found myself back in a Netflix True Crime uh B love it and it all started with Lacy Peterson I am about to watch it this weekend and I'm so excited I said to my husband yesterday are you going to be mad if I watch this without you because he's away this weekend and he's like no I'm like good cuz it's going to happen listen to single girl here living it up I goes out of town and she's just like binging Netflix there you go binging True Crime Netflix hello can't I can't wait to hear your view of this CU there's a whole like Scott Peterson Innocence Project I don't understand this I don't get it and you watch this and you're like come on guys there's no way yeah no I know it seems so weird understand how we I did do a little reading it's not the real Innocence Project it's like a spin-off of the Innocence Project it's the LA or something Innocence Project but it's not like the inance project project like the Adon say in it's not that one so anyways uh there was that one I I tried the what was the other one I watched it was about a couple and she was abducted and no one believed that she was abducted and it was kind of pre- Internet so people not pre- interet but like pre- links between uh police stations and So eventually this wonderful hardworking detective working her first case kind of followed a trail yeah on a you know an abduction in her own area and realized that this poor woman's story was true and uh that was really cool sorry I don't remember the name um but we figure it out just start talking about true crime and Netflix will just feed it to you on the AL that that's very true yeah you can say anything and suddenly you have it but that's exciting um did you see that in the dark is back I I haven't listened to it yet I started listening to the first episode of my way to work this morning loving it so far but just in general in the dark is amazing um AF I think it's Afghanistan I do apologize uh from our Middle Eastern listeners that I cannot remember which country it is um but it's a whole like murder situation where like he thinks um this gentleman's family has disappeared Etc but it's very very good and this was like many many years ago that this happened so now they're just getting to it now in the dark T does this type of stuff obviously yeah Cal is a gateway drug to True Crime podcast it's true but in the dark is the the champagne I mean like it is Chef kiss it's that first couple seasons of in the dark was was amazing so this is the third season uh highly recommend like I said I've only about halfway through the first episode I think there's like five or six of them now so I'm really excited to also bch that this weekend probably when you're running yeah yeah exactly exactly so yeah that that's a really good idea is to run in the dark we listen to True Crime podcast I'm not saying I'm smart but all right well she'll be the one out there with the uh bear whistle and the dog very reflective coat and yeah we're fine everything's fine all right well that is it for us we will be back next week and double checking yes like we have to look sideways that's September that's kind of crazy how is it September so it's also it's the night before the gay Packers first game of the season ah so excited anyways you may see me in Jordan love Jersey next week all right is.ca courses intro or blueprint reading for construction project click the link below it'll help you in your career and we will see you next week for sure"

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"VideoID": "3299",

"Title": "Fast Trax® Commercial &quot;GREEN&quot; Program | Commercial Electrical Codes",

"URL": "https://www.youtube.com/watch?v=j-pWwlu1Sfs",

"Keyword": "Electrical blueprint reading",

"Transcript": "[Music] well hey everybody welcome to another episode of master the nec tonight's episode we're going to talk about the electrician's academy and the commercial program that's involved in the electricians academy of course you can find out more about it by going to electrical instructor dot com again electrical instructor dot com and you can find out everything you want to know about our residential our commercial our industrial our grounding and bonding and our electricity 101 courses as well as our two-year certificate of completion program now look these programs are designed to take your game to the next level they're all about electricians who who have their license or even apprentices who are studying on the job and they want to have some curriculum to study in the evening the supplement maybe apprenticeship program but they really want to gain quicker more knowledgeable experience without waiting all that time to get that experience so this program is going to teach you tips and tricks talk about things like the commercial blueprint reading and and things like transformers and motors all those things you need to know as a commercial electrician but again you don't want to have to wait forever to shorten that learning curve you don't want to learn from other people who don't want to share information you want to learn all the things that are important for you to be successful that's what this program is we build leaders and the electricians academy is designed specifically for those who have a license who want to take their game to the next level and reduce that learning curve and find out a bunch of useful information when it comes to commercial wiring so without further ado let's actually look at what you're seeing in the program so in the program you'll have your own console as you can see here on the right you'll have different buttons that do various things a little blue book over there will actually open up the workbook at any time even if you're taking quizzes it'll open up the book so you can work in the quiz but you can also use the textbook as well we have what's called a study hub which you'll see in a minute that allows you to look at all the things that you've highlighted whether you're going to take it and send us an email if you've got some kind of question in the program all that's going to be available to you as well okay so here's what you get so let's kind of look at the program a little bit so you've got multiple chapters in fact you have 22 chapters you'll notice that you have the blueprints down here so all the blueprints that we talk about in the program are all here for you to be able to print out or view online we'll look at those in a second so let's kind of go up here and kind of look at the start so you have you have 22 chapters each one of these chapters are designed to really engulf you in understanding the different things that are involved in commercial wiring and we take you through step by step from commercial building plans to reading electrical working drawings the requirements for conductors brand circuits switches wiring methods motors feeder load calculations special systems uh working drawings on the upper level so we walk you through the different drawings and blueprints and how that works panel selection installation electrical service the grounding that's involved in the commercial application the luminaires emergency but check it out we also go over things like short circuit calculations we go over low voltage remote control we even talk about the electrical as it associates with cooling system and of course uh commercial utility interactive pv systems are all included here a glossary of terms which helps you really understand a lot of those really important terms but let's go and go up here and look at some of the more important things that we might run into brand circuits so what you'll see is you'll have your normal course reading material you'll have a bunch of different study tools okay here they are in here a lot of videos a lot of interaction explaining a lot of detail brand circuits uh all of them been incorporated into the program and of course you can watch any of them straight from here for example if i click on this you'll see that it'll bring up a video and it'll bring up a video that you can watch so you'll learn a lot of important information all in these study tools and these are generally about the branch circuit applications now let's look at the reading material because this is the important part you need to read it but it's a lot of good graphics a lot of good tables and it all interacts with you together now a couple features let's say you're a little tired you've been working during the day because remember this is not to replace your hands on this is to supplement the hands-on so in the day while you're learning all these skills at night you're kind of maintaining that knowledge bank you're starting to read things and understand things and then when you get into the field you can really impress your master electrician or your foreman or the owner or maybe you're the owner and you have all of your guys and gals in this program so that you all are on the same page but check this out one of the features we have is the ballistic training feature where you highlight it left click drag it over it and you've got a note you can do you can highlight it and i'll show you what happens when we highlight it let's go and highlight it right now and i'll show you in a second but let's highlight it again with our mouse and let's do the read text now check this out now you might get an echo because i'm recording from this mic but check it out here's what it is this factor is taken from nec table 310.15 parenthesis c in parenthesis parenthesis one in parenthesis and is used to compensate for the increase in temperature caused by grouping current carrying conductors in a raceway or cable okay so you just simply listen read along with the bouncing ball if you s if you will and you will start to absorb the information and of course it's associated with various tables in this case it's talking about the number of current carrying conductors when it exceeds three so again you'll learn about it you'll see the tables and you just simply move through it and you click the arrow and you go to the next thing and it talks about minimum wire sizing and you start following it down and you will begin to learn it anything in the program is printable you can print it out at any time all right the other thing is you can change the size of the text if that's not hard because you can use this program this is important you can use it on a mobile device you can use it on a tablet you can use it in a pc and so you might want to change the text so you click it here and it gets larger click here again and it goes back to smaller again you can highlight it mouse click over it you can change a color you can read it you can add a note if you want to add yourself a note but when you add that highlight like we did on the last one you come over here to what's called study hub you click on your study hub and you go to your notes you see we're in chapter four this is what we highlighted all this information is what we highlighted previously now what you can do is you can click on it and drag over it and then you right click and you can copy that paste that in an email if there's something during our program that you don't understand here at the electricians academy and the electrical code academy incorporated we want to be able to answer those questions for you we really want you to learn in depth all these topics okay so we will walk you through it as necessary so again that's a great feature it's one-on-one with us and for the price unmatched anywhere now let me show you a little something else also you're going to have your quizzes and you're going to have your reviews so in here you've got all of these uh different videos you can watch but then you'll have a review for every unit now let me show you what happens so you click your review now here's where we're different than everybody else there is no way that you're just gonna get a b and c type of selections here we expect you to work through them so every one of these are clickable and you fill it in based on the information that you learned during the course okay so you'll have all the information here and you just simply click it and you fill in the blanks right here and there is absolutely you'll notice you have five items here and each one of these you're going to solve for one answer goes in here you're gonna solve for two answer goes in here you're gonna solve for three answer goes in here and you're gonna do the same thing as you go on down and you get your answers to every one of them then you're gonna submit it you're gonna submit it by clicking this button right here and we are going to grade it and we're going to give you great feedback because you're going to learn how to do this all in this program and it's a lot of information i mean check it out you're going to learn things like load modifier modifier load types selecting the proper over current protected device the minimum conductor size all this kind of stuff going to totally hone your skills and it's just chapter four that's it okay so again a lot of information here for you to absorb but at any time we're here to help that's the benefit of our programs so the electricians academy is a little different than anything we've done before because this is dedicated help that we have in this program and it's really a great program to teach you what you need to know about not only electrical wiring but the code as well and this one's based on the 2020 national electrical code we also have a 2017 edition as well so you choose whatever you need now once you submit this will grade it and you'll be able to go back and check your grading and you'll be able to see our comments and a lot of times the instructor will also email you different things different comments if it might be easier to put it in an email all right now after that's all done you're still going to have another quiz to validate what you've learned so here you start your assessment and in this case right here you've only got 10 questions and so you're going to you're going to read your question and you're going to answer it and you're going to check your work and you're going to submit it and this gets graded right away so again it really allows you to immerse yourself test your knowledge now this is never going to take the hands-on portion out of learning you're going to learn on the job however it can take quite a long time to amass that knowledge of commercial wiring this program will get you up to speed reduce that learning curve and help you get more advanced quickly wherever you're working at so this is again part of the program and there's a lot of videos and you just simply go through each one of these units all the way down and we also give you exam style questions so you can also test your knowledge to make sure that you really are learning not just how to use the nec but how to actually apply the nec to a lot of these high quality questions okay now blueprints all of the blueprints are available here give you an example and sometimes they're going to be referred to in your course material and this is where you go to get it for example here's the second floor electrical drawing as you can see here it is detailed drawing you'll learn about all this the switches the circuitry what the hashes mean all of this you'll even see that the circuits are labeled all of this goes around so you can find the home run which circuit they're supplied from here for example 11 through 13s right here for this right so again so much information in this program you can print any of this out as you can see right here you can download it do whatever you want with it but we'll even give you this check it out in your plan let's go first floor plan we'll even give you a clean one so you can actually make changes on it yourself and do different things that you want to add no problem you get access to it many people say can i get a clean blueprint so that i can draw on it and do things absolutely you can get that as well so again motors what do you want to know about motors where you're reading material getting into motors here strings things happen talks about motors three-phase explains how the application works it'll actually talk about unbalanced voltages what happens all the stuff that you need to learn because you're going to run into those things on the job and you need to know what it means and this course is going to be the one to do that for you again you can bookmark any page let's say we bookmarked this and we wanted to come back later so we come back into our program and we didn't know where we were at let's just kind of do that for example and say we didn't know where we left off then i could go over here to my study hub and i can go to my bookmarks and this is right here and we can go right back to where i left off before anytime you want to remove it you just simply click that okay it removes the bookmark continue on your journey and you bookmark the next page whenever you re leave off where you were before again available on tablets available on your android or apple products mac products pcs perfectly acceptable to be able to do all of your work directly from any type of pc or device that you need to be able to do your course work okay so again the full book is always available right here i can click it and here you get access to the book the table of contents if i'm working on something in seven two i can jump right here and i'm right here in the book seven two in and i can go right here and i get the same information that i would get in the book in your course reading material why is this important because even if i'm taking a review quiz i might want to jump to that chapter or that unit so i can refresh something i read so that i can answer a question again it's all part of the learning process you get access to all that in here we have you have glossaries so you have all these terms that you can click on l labeling and again it's good read so you know what some of these terms are it not only gives it to you in english but also in spanish so that's great as well so so much now the voice if you want to change the voice you have that option as well so i can read the text but if i wanted to change the voice let's say i didn't want to go with the us type of accent i can go with an australian accent for example so we'll do female australian accent and we'll go right here and i'll just give you a sample of that what really causes havoc to a motor is unbalanced voltage unbalanced voltage causes unbalanced currents in the motor stator windings what really causes okay so again really flexible you can print any page you can print the whole book if you want page by page most people need to you're going to have access to this for 365 days so you can go back refresh whatever you want if there's something specific that you want to print out like maybe this entire chapter 7-2 then you use this print feature and just print out every bit of the information that you want you have rights to do that okay in the program so hopefully you've got something out of this there's a lot of quizzes there's a lot of reviews you're really going to learn it's going to test you and it's just a great commercial program so hopefully you get something out of that so that's the concept of the commercial program it's extensive it goes into extreme detail so you've got to make a choice if you're new in the commercial wiring say you're from residential and you're going to the commercial you need to get up to speed quickly this program will get you up to speed quickly and teach you all the tips and tricks all the little things about unbalanced load what can happen on motors all the little ins and outs that pretty much people have to learn over time you're going to be ahead of the curb and if you're an experienced electrician or even a master this is still a great program because this really does kind of answer all of those moments that you might have had great program for that i'm also very pleased to say that i'm also a co-author of these books that this program is built on so i'm excited about that that you're getting them and again i think you'll love them so if you want more information on our commercial wiring program check us out at electricalinstructor.com thanks again for watching until next time stay safe god bless [Music] you"

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{

"VideoID": "3336",

"Title": "Milwaukee packout electrical van @MilwaukeeTool #dirtyhandscleanmoney #electrician",

"URL": "https://www.youtube.com/watch?v=wquv-J4crxs",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] keep on falling for me i love the way [Music]"

},

{

"VideoID": "3350",

"Title": "Building a 600 amp 3 phase Electrical Service",

"URL": "https://www.youtube.com/watch?v=qI8jfmP8raA",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "the electricians started building the electrical service for the warehouse today first they mounted this trough for the wires to pass through then they installed three pieces of rigid conduit with weatherproof connectors called Myers hubs they punched three holes in the CT cabinet for the hubs to connect to with this hydraulic punch just select the size punch you need for the conduit and start pumping it slowly pulls the punch through the metal and cuts a perfect hole this building gets 600 amp three-phase power with three 200 amp panels one in the offices and two in the warehouse the runners need three-phase power for their frame machine and paint booth next the guys installed these disconnects and put specialized fuses in them they gave us the ability to disconnect or turn off the power to each panel from outside the building so we have the CT cabinet right here the meter base to the left this trough that the wires pass through and three disconnects this is the kind of thing the average person would never even notice but I think it's really cool let me know if you agree"

},

{

"VideoID": "3351",

"Title": "You Need This Tool for Marine Electrical Work!",

"URL": "https://www.youtube.com/watch?v=U4RUHo1dRKQ",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "you don't have a set of these wire strippers these are really handy for electrical projects on the boat look at this make short work stripping these wires and they're precise every time oh"

},

{

"VideoID": "3367",

"Title": "Hangzhou BETE Hydraulic Tools Manufacturer -Electrical Construction Tools",

"URL": "https://www.youtube.com/watch?v=O0qF\_dQm8kM",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] from a small crimping die to Solutions covering electrical connections pipeline connections large equipment installation lithium battery Gardens and mobile energy storage beat adhere to the original intention of 16 years integrate technology and application to create a comprehensive service system and when the favor of Global users no matter where you are it will provide you with better Solutions in the first [Music] time always believe in the power of to be better this belief drives us to constantly break through ourselves focus on Cutting Edge technology and high and equipment in the industry keep a low-key layout continue to expand integrate Superior resources adhere to technology leadership carry out International cooperation promote digital transformation build a new pattern of intelligent manufacturing and brand bets imprint on the [Music] world provide products with high level multiple Cate categories and high added value for the market our duty is to produce hydraulic tools pipeline hydraulic tools large equipment to installation hydraulic tools lithium battery garden tools and mobile energy storage equipment committed to becoming a leader in the field of hydraulic tools Deer tools based on constant thinking about customers needs so we concentrate on researching user needs gain insight into the great changes in the development of the world and gather a better Talent team to create a complete industrial chain integrating R&D manufacturing Sales and Service adhere to Independent Innovation and open cooperation [Music] appraised as a national high-tech Enterprise an excellent innov ative company in Jon Province hjo Enterprise Hightech car and denter intellectual property management system certification taso 901 certification C certification 70 plus patent certificates behind every honor is our ultimate pursuit of [Music] products from raw materials to product delivery we introduce sophisticated professional production and testing equipment to check every key step using Advanced production technology combined with scientific and accurate test methods to effectively improve the product service life let customers witness our unique Ingenuity in every detail not only meet the needs of domestic high-end customers but also in line with International standards through digital operations bring our products and services to every corner of the world dor development comes from people oriented Drive Talent is always the most valuable asset of beat we use the company's sustainable development to empower employees with value incentives with the efforts of every beat person happiness indexes is rising and Company's business is [Music] booming every carving is to achieve a better [Music] goal every breakthrough is to achieve a better self beat take mission to manufacture with all our strength Share value with the world become a powerful tool brand in the new era to achieve a win-win situation and create a better future [Music]"

},

{

"VideoID": "3371",

"Title": "Klein Tools1Integrated Corner Piece -BucketWork 1000V-35kV. #kleintools #shorts #electrical",

"URL": "https://www.youtube.com/watch?v=UTn\_mvDV8k4",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] thank you"

},

{

"VideoID": "3396",

"Title": "#metalworking #plumber #equipment #dewalt #welding technology #toolbox #s#electrical #cnc ##art",

"URL": "https://www.youtube.com/watch?v=vXwi7FYpl84",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "this reader is one of the coolest fastest and strongest ways of patching small holes I think the name of it is California method I don't know why this seems more of like a Florida man type of situation but essentially what you're going to do is create a piece of drywall that's bigger than the hole itself Trace out the middle rip off the sides and then just compound it in place like this super super strong and easy"

},

{

"VideoID": "3402",

"Title": "Electrical Mowing Boat With The Newest Emission",

"URL": "https://www.youtube.com/watch?v=hLTFKExYC0Y",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Applause] [Music] thank you [Music] [Music]"

},

{

"VideoID": "3455",

"Title": "Electrical Equipment",

"URL": "https://www.youtube.com/watch?v=sdMviz0WNCs",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "foreign"

},

{

"VideoID": "3474",

"Title": "Energize Electrical Construction",

"URL": "https://www.youtube.com/watch?v=65Vf6Be0FGk",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "I"

},

{

"VideoID": "3476",

"Title": "Electrical Work where someone said #GoodEnough #electric #fail #construction",

"URL": "https://www.youtube.com/watch?v=KO\_8tqQprws",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "hey guys morgan's maintenance i have a good enough for you today as we can see i just finished we tore out this ceiling it's a drop ceiling and somebody has wired a light fixture into that old ceiling this is how it was wired with one of them neat new invisible junction boxes and non-shielded cable but what you can see they did here was they just basically broke the conduit pulled the wires out wired it directly into a light just like you see and of course there is no ground wire because this is an older building an old system the conduit being used as the ground luckily there's nothing after it or else it would be ungrounded as well but you can see this this this pipe right here which is a plastic pipe has the cable going into it to this gfi and if i take my tester and i put it in we've got open ground but at the end of the day this is just one of those jobs where somebody got done doing it and they looked at it and they said you know what that's good enough see you guys on the next video"

},

{

"VideoID": "3482",

"Title": "electrical mistakes to avoid⚡️ 480 HIGHVOLTAGE ! #shorts #fyp #electrical #contractors",

"URL": "https://www.youtube.com/watch?v=vgWANJPyIsw",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "go inside here this wire is actually too small for these lugs it's number six through 250. and you can see that it's already loose number four here so number four typically would be 70 amp breaker minimum um you're not gonna run number four for fun unless you've got voltage drop or something so number 10 is not good for anything more than 60 amps for the equipment ground on 250.122 and then look at the connector that's actually an EMT connector should be a lock ring and a bonding bushing because of the eccentric and concentric knockout there so got a couple of issues [Music] and same thing"

},

{

"VideoID": "3493",

"Title": "Electrical Replacement Parts for Switchgear and Circuit Breakers",

"URL": "https://www.youtube.com/watch?v=HOrXkEFtYBM",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "hello everyone Cody here with BCS switch gear and the parts guessing game so if anyone would guess what this is maybe what breaker it goes on or Breakers that it goes on if you guess one it's good enough but it goes on several Breakers if anybody can guess what this is please comment below we'd love to hear from you if not share it with somebody that you might think uh might know the answer y'all have a great day take care and look for more videos like this in the future thank you"

},

{

"VideoID": "3497",

"Title": "Electrical Earthing Hole Works By Drill Machine",

"URL": "https://www.youtube.com/watch?v=1tQVwm6QdN8",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] thank you"

},

{

"VideoID": "3507",

"Title": "⚡Electrical Spark with Nailer - Be Safe⚡ #shorts #electric #blooper",

"URL": "https://www.youtube.com/watch?v=q511fJZunYw",

"Keyword": "Electrical construction tools and equipment",

"Transcript": " What was that? I \n like capped the wrong wire. This one's hot. \n"

},

{

"VideoID": "3523",

"Title": "and the wire pulling continues #nyc #construction #electrical #electrician",

"URL": "https://www.youtube.com/watch?v=dixjFUQ\_8W0",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] [Music] thank you [Music]"

},

{

"VideoID": "3525",

"Title": "Solar Mechanical Module Structure Fabrication work#solar #electrical #reels #trending #ytshorts",

"URL": "https://www.youtube.com/watch?v=1-8y8srT1QE",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] foreign [Music] thank you [Music]"

},

{

"VideoID": "3535",

"Title": "How Electrical Wires Are Pulled Into a Building",

"URL": "https://www.youtube.com/watch?v=xJegtVgrFXU",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] now get her back get your baby back never going to find that one again never get him back now"

},

{

"VideoID": "3538",

"Title": "These are Essential Tools for Electricians - Must Have for Electrical",

"URL": "https://www.youtube.com/watch?v=jP9VyPvxGpI",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "from the non-conductive tool company six functions two tools total control introducing volt cloth a lightweight time-saving hand tool designed to safely handle electrical wires the hold claw is essential equipment for any electricians tool belt for safely reaching into junction boxes switches and breaker and service panels in any residential commercial or industrial wiring system as is standard procedure before any job make sure to turn off power at the breaker box and check the contacts with your voltage detector the volt claw pulls wire bends wire loops wire and reloads boxes with these two tools total control with its lightweight ergonomic design the volt clock is revolutionary in its design and simplicity whereas metal tools such as lineman pliers conduct electricity and often destroy the wire insulation the whole claw handles wire much better than conventional metal tools built for ease and convenience with two models to choose from the Volt claw 12 gauge expertly handles and manipulates 12 to 14 gauge wire perfect for residential and light commercial applications it's a non conductive tool designed to pull then loop loosen both wing wire nuts and ribbed wire nuts and easily load boxes with its innovative v-groove tip the Volt Claw multi gauge is the industrial model designed to handle 6 to 14 gauge wire with an innovative hook sliding thumb mechanism and grab claw the multi gauge volt claw is the perfect tool to pull wire from junction boxes and service panels and combined with the 12 gauge volt clock the two works side-by-side in a variety of applications both models are lightweight with an ergonomic design into bed twist and release wire in four gang switch boxes GFCI sockets junction boxes contactors al junctions light switches smoke detectors outlets timers and motion lights no more fingers reaching into crowded electrical boxes and no more working with conductive metal pliers no more getting shocked the world runs on electrical wires and we make the tools to handle them safely from the inductive tool company boat claw a tool every electrician should have go to vote claw comm for more information volt claw for 160 years climb tools has been known for cutting from our side cut pliers to our ratchet and cable cutters to our bolt cutters client has been the expert and the leader in cutting now we have the same technology knowledge and experience available in battery-operated tools [Music] [Music] [Music] [Music] [Applause] [Music] [Applause] quality durable battery-operated tools all with the performance and reliability professionals expect from Klein Klein tools for the professional linemen since 1857 Ripley's utility tool brand of products provides wire and cable preparation tools to splice and terminate cable for the power transmission and distribution electrical construction and maintenance industries the lws68 snap is a power driven and stripper for the service entrance wire th h n/x h HW photovoltaic and many others secondary cable constructions the lws68 snap utilizes ripley's 4x4 bushings bushings are matched to a particular cable based on its conductor size and insulation thickness the sizing charts are provided in the Ripley tool catalog or a cable sample can be provided to the Ripley factory for sizing the bushing can be removed from the tool and inserted into the lws68 snap to be power driven set the desired stripped length quickly and easily by aligning the red band to the scale mark and tightening this group assemble the bushing by pushing the quick release collar upward to easily disengage the internal lock pin insert the selected bushing into the tool with the bushing crosshole aligned with the lock pin release the collar to lock the bushing into the tool ensure the lock pin engages the cross hole in the bushing secure the tool into the drill ensure that the cable is as straight as possible and the tool is aligned properly with a cable access operate the drill at a slow speed apply gentle forward pressure when the insulation chip breaks off at the end of the cut stop the drill first and then remove the cable from the two the drill should be stopped when extracting the cable from the tool the lws68 snap is sold with optional drive ends a 3/8 inch drill drive a quarter-inch hex drive a 3/8 inch square socket drive and a half inch square socket driver are all available to change the drill drive use a hex key to loosen the screw and pull the drive out replaced with the desired drill drive when inserting the new drive ensure the indent on the drive aligns with the screw and use the hex key to tighten the screw and hold the drive in place for more information about utility tool by Ripley please visit our website at wwlp.com the Joan art industry's UST 125 coax stripping tool is designed to strip rg59 rg6 rg6 tri and quad RG 7 & RG 11 coaxial cables for CA TV and video applications this smart sleek and versatile design makes prepping cable simple quick and affordable this stripping tool also features a velcro braid brush and a directional arrow that shows you which way to turn the tool the UST 1:25 model uses the UST 225 blade cartridge for rg59 rg6 rg6 cable and is capable of making over five thousand cuts to use the UST 125 coax stripping tool first determine which size cable you are stripping and place the blade in the tool accordingly next insert the cable into the tool up to the blade stop after cable insertion turn the tool three to five times around the cable until you no longer feel any resistance note the directional arrow on the tool indicates which way to turn the tool remove the tool and pull the strip jacket and shield away from the cable and use the brave brush to brush the braid down the cable is now ready to be terminated when use the speed Sparky to find positions on drywall what want to do is grab find the desired height you can then position the speedy Sparky in relation to the position for the choices that will then give you the ability to put in multiple sockets without shifting them too far apart you're then going to brown your multiple sockets and then you can cut these out and be ready to go job done you [Music]"

},

{

"VideoID": "3549",

"Title": "WC fixing | Concealed WC | Gulf Technician #plumbing #bahrain #construction #electrical",

"URL": "https://www.youtube.com/watch?v=MQ6OxcziKhQ",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "no it's time [Music]"

},

{

"VideoID": "3559",

"Title": "Installing Recessed Floor Electrical Outlet Box",

"URL": "https://www.youtube.com/watch?v=3caAadjxG4w",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] [Music] oh [Music] w"

},

{

"VideoID": "3561",

"Title": "Lineman hammer😂—IG:electrician\_life #electrical #electricalwork #instaelectric #instaelectrical",

"URL": "https://www.youtube.com/watch?v=lXZMe0hBB4c",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "lineman hammer"

},

{

"VideoID": "3575",

"Title": "How to provide Electrical Conduits in RCC Roof Slab before Casting ? #trending #reels #viral #shorts",

"URL": "https://www.youtube.com/watch?v=7BeeRN8IJAo",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "I know [Music] yeah [Music] I can do this every morning every evening if you screaming straight back to Sunrise why not"

},

{

"VideoID": "3576",

"Title": "Good idea #fpy #omg #electrical #electricalengineering #foryou #foryou",

"URL": "https://www.youtube.com/watch?v=RnwH7wEjR2o",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] you"

},

{

"VideoID": "3596",

"Title": "Always check electrical connections on startup / PMs on hvac equipment !!!",

"URL": "https://www.youtube.com/watch?v=2fd3n3smdHo",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "[Music] vip"

},

{

"VideoID": "3617",

"Title": "Not enough room in electrical panel",

"URL": "https://www.youtube.com/watch?v=uZ4cqZXNrYA",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "so this is something that you should look at as a contractor that's considering doing adding on a basement bathroom make sure that they have enough ability here because this is something that you know it's going to cost the client a couple thousand dollars to change out now and if they didn't know this you know it could be kind of an argument point I got two 15 amps into this breaker they got two into this one well then guess this is gonna have to be done sooner than later yeah there definitely isn't enough room here I mean at least it's a basement bathroom it's not like it's affecting the rest of the house like it's not like you need this"

},

{

"VideoID": "3621",

"Title": "What is inside a 200MFD capacitor?electrical #",

"URL": "https://www.youtube.com/watch?v=w4t3817YYkI",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "foreign"

},

{

"VideoID": "3637",

"Title": "Basic Safety 003 Trivia Clips #teslaharmonics #safetyfirst #electricalsafety #electrical #safety",

"URL": "https://www.youtube.com/watch?v=nprjWNnHH9M",

"Keyword": "Electrical construction tools and equipment",

"Transcript": "daily inspection of an excavation must be performed by a competent person one of the most common grounding systems used for protection against accidental electrical shock is the three wire system a polarized electrical receptacle is used for double insulated tools which of the following is the correct practice for a lockout tagout situation multiple lockout devices are required when more than one person is working a system that protects workers from the release of hazardous energy while they work with machines and equipment is referred to as lock out tag out in general eye protection is required whenever you are on a job site"

}

]