

Electrical Installation and Maintenance

First Quarter-Module 2 Part 3
Wireways and Cable Tray



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Paano iniwasan ng ating pamilya ang COVID-19?



Inaalagaan ba natin ang ating kalusugan sa pamamagitan ng **sapat na tulog, ehersisyo, at masustansyang pagkain?**



Lagi ba tayong **naghuhugas ng kamay** gamit ang sabon at tubig o mga alcohol-based na produkto?



Pinapanatili ba natin ang kalinisan sa pamamagitan ng **palagiang pagdi-disinfect ng bahay?**



Binubuksan ba natin ang mga bintana para **makadaloy ang hangin** (natural ventilation)?



Iniiwasan ba natin ang **paglabas ng bahay at pagpapapasok ng bisita** kung hindi naman kailangan? Kung may lalabas man, tayo ba ay nagsusuot ng **face mask at face shield?**



Nagbabasa o nakikinig ba tayo sa mga **balita at bagong impormasyon** tungkol sa COVID-19?



Tinatandaan ba natin ang mga **karaniwang sintomas** ng COVID-19? At alam ba natin kung saan tatawag kung sakaling mayroong may sintomas sa pamilya?



Tinuturuan ba tayo ng ating mga magulang at nagiging mabuti ba silang modelo ng mga nabanggit na health at safety protocols?

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Marikina

Make Marikina COVID-19 Free
Stay safe, stay healthy!



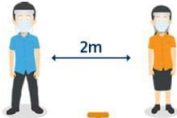
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MGA PAALALA UPANG MAIWASAN ANG COVID-19



Laging magsuot ng face mask at face shield.



Practice Social Distancing
(Dumistansya ng 2 metro kapag nakikipag-usap)



Laging maghugas ng kamay at gumamit ng alcohol.



Kumain ng masustansyang pagkain at uminom ng maraming tubig.



Uminom ng bitamina.



Panatilihing malinis ang kapaligiran.



Manatili lamang sa bahay kung walang mahalagang aasikasuhin at panatilihing ligtas ang tahanan sa COVID-19.



Agad sumangguni sa inyong doktor o pinakamalapit na health center kapag nakaramdam ng mga palatandaan ng COVID-19.

Marikina COVID-19 Hotlines:



0926 626 3695
0927 456 6682
0961 470 3326
0961 470 3327

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HINDI PA TAPOS ANG LABAN SA COVID-19: MGA PAALALA LABAN SA FAMILY CLUSTER INFECTION

Iwasan ang hawaan sa pamilya, gawing ligtas ang tahanan. TANDAAN:



**MARIKINA COVID-19
CALL CENTER**

HOTLINE:

0926-626-3695

0927-456-6682

0961-470-3326

0961-470-3327

**SWAB
TEST**



GAWING LIGTAS ANG TAHANAN.



- Huwag balewalain ang sintomas ng COVID-19
- Sundin ang quarantine protocols
- Huwag munang mag-dine in sa mga kainan/café
- Iwasan ang selebrasyon, inuman, at pagtambay
- Iwasan ang pulutong ng mga tao
- Huwag huhubarin ang face mask kapag nakikipagusap at panatilihin ang 2 meters na distansya
- Iwasan magpapasok ng mga bisita na hindi essential sa loob ng bahay
- Palaging maghugas ng kamay

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Hindi kaya ng pamahalaan lamang.
Magkakasama nating talunin ang COVID-19 sa Marikina.

PARA SA LIGTAS NA MARIKINA

Lesson

Cable Tray



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A Cable tray installation requires coordination of manpower from both electrical and mechanical skills. If cable tray has been installed properly in a project it can enhance safety of electrical wiring system, save space materials, labor, time and maintenance extension will be easier to install than any other wiring system.



What I Know

JUMBLED LETTERS

Re-arrange the jumbled letters to get the correct answer and write on the space provided.

_____ 1. **L A C T R I C E L E I I R W G N**

It is the term for connecting different wiring devices, lighting fixtures for the distribution of electrical energy.

_____ 2. **I T T N G F S I**

It is adapter that used in electrical wiring system like in conduit pipes, wireways or even in cable tray system.

_____ 3. **C A E L B Y R A T**

It is used to support the wiring system in large scale industries, power distribution or telecommunication cables.

_____ 4. **S T A I N L A L N I O T**

It is an act of putting, adding and extending of something in a position so it can work.



What's In

Cable Tray

According to the Philippine Electrical Code (PEC) a cable tray is similar to a wireway unit or assembly of unit and its associated fittings forming a structural system which is used to securely fasten or support cables and raceway. It is installed to enclose and hold wires and cables in power plants, power distribution and large scale industry.

? What's New

Philippine Electrical Code (PEC) describe also the installation of cable tray are following:

1.Complete system

- Bends and modifications shall be made that the electrical continuity of the cable tray system and support for the cables is maintained.
- Shall be permitted to have mechanically discontinuous segment between cable tray runs and equipment.

2.Complete before installation

- It should be complete before the installation of the cables.

3.Covers

- Covers and enclosure are required in the portion of runs; the required protection shall be a material compatible with the cable tray.

4.Through Partition

- Cable tray can extend through partitions and walls or vertically through platforms and floors in wet or dry locations.

5. Exposed and Accessible

- It should be exposed and accessible.

6. Adequate Access

- It should be enough space for maintenance.

8.Marking

- It should have permanent readable, visible warning signs ex. "DANGER HIGH VOLTAGE KEEP AWAY" for cable tray with conductors having rated over 600 volts.

Types of Cable Tray



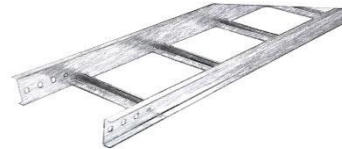


1. Channel Cable Tray

It is used for application with limited numbers of cable usually installed when conduit is less applicable.

2. Ladder Cable Tray

It is used in general applications and look like a rail way having two sides connected individual. The purpose of using ventilated cable tray has provided more support than the other types.

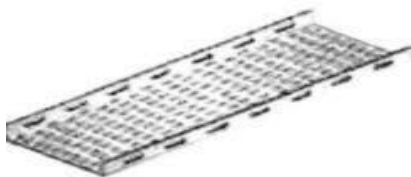
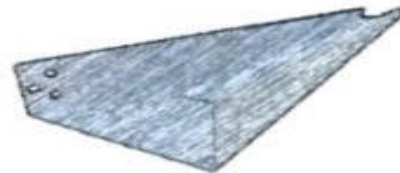


3. Single Rail Cable Tray

It is a cable tray system or the fastest system to install and uninstall cables because of its aesthetics and usually used for low voltages.

4. Solid Bottom Cable Tray

Used for telecommunication cables or for low heat generating applications. The purpose using solid bottom cable tray is the solid shielding part where applicable for those sensitive circuit.

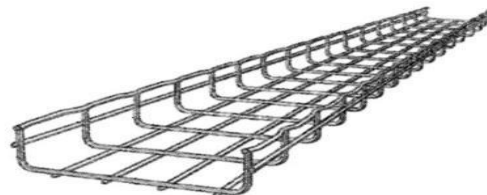


5. Through Cable Tray

A cable tray with moderate ventilation providing cable support every four inches.

6. Wire Mesh Cable Tray

General purpose for telecommunication and fiber optics cables. The fabrication is made of steel wires welded together in all intersections for support.



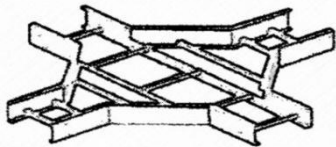
What Is It



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Cable Tray Fittings

There are different cable tray fittings that are made compatible to each type of cable tray. These fittings are used to support cable tray in changing direction and size according to plan. The following are the cable tray fittings identified and defined in *Technology and Livelihood Education (TLE) 10 Electrical Installation & Maintenance (Specialization)* (2015) by Mogado, Jomar P. of Trinitas Publishing Inc. on pp. 65-71.

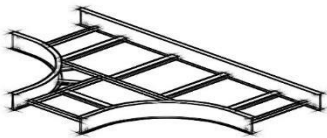


1 Horizontal Cross

A cable tray fittings used to join cables in four directions.

2 Horizontal Elbow

Use to bend the direction of the cable tray in horizontal pattern

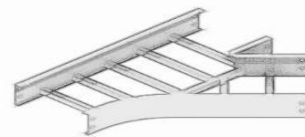


3 Horizontal Tee

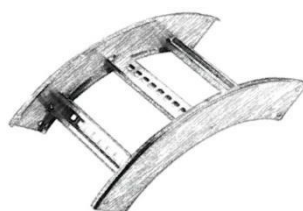
It is used to change the horizontal direction of the cable tray in three directions.

4 Horizontal Wye

A cable tray fittings used to bend the direction to 45 °or 135°.



(A)



(B)

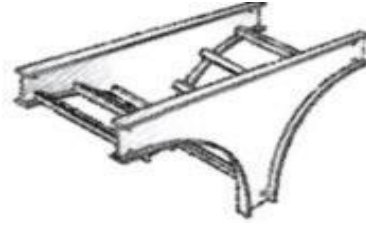
5 Vertical Elbow

There are two types of vertical elbow

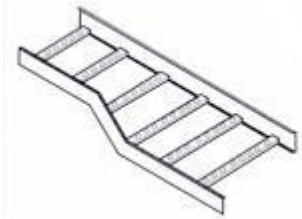
- (A) one is the direction of cable tray upward from the horizontal connection and
- (B) the other one is downward from the horizontal plane.

6. Vertical Tee

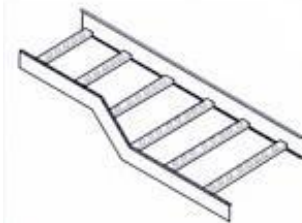
A cable tray fitting with three directions the two horizontal connection down to vertical direction or aesthetics look like a funnel.



a.



b.



c.

7 Reducer

Reducers are used to minimize the width of the cable tray. There are three types of reducers.

- a. First is the straight reducers which can give equal reduction of both sides of a cable tray.
- b. The second is right hand reducers can reduce cable tray to right side.
- c. And the last one is the left hand reducers that can reduce the cable tray to left side.

Remember

It depends on the diagram location on how to apply the cable tray fittings same as wireway fittings.



What's More

List down the types of cable tray.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____



What I Have Learned

Answer the following questions below. (5pts. each)

1. Why is it necessary to choose the types of cable tray according on electrical wiring system?

2. What is the importance of using cable tray in industries?

RUBRICS FOR ESSAY TYPE

CRITERIA	SCORING GUIDE				Student's Rating
	(8-10)	(5-7)	(2-4)	(0-1)	
Organization	The introduction is	The introduction	The introduction is	No clear introduction	



	relevant and presented in logical order. The conclusion is included and clear	is presented relevant to the topic. The conclusion is included, but does not strengthen the answer	presented and few relevant to the topic. The conclusion is included, but not especially relevant	and conclusion	
Details	Main ideas are clear and well supported by detailed and accurate info.	Main ideas are clear but are not supported by detailed info.	Main ideas are not especially clear	Main ideas are not clear	
Sentence, Grammar and Spelling	All sentence are well-constructed, there are very few errors in grammar or spelling	Most sentence are well-constructed, there are very few errors in grammar or spelling	Most sentence are well constructed but, there several errors in grammar or spelling.	Words in sentence are repetitive, there are numerous errors in grammar or spelling.	
Total Score 30 points					



What I Can Do

OFFLINE ACTIVITY

Write the description of the following cable tray fittings based on your understanding.

1. Reducer

2. Horizontal Cross



3. Horizontal Wye

4. Vertical Tee

5. Vertical Elbow

ONLINE ACTIVITY

Create a powerpoint presentation about safety practices of installing any type of cable tray insert some captions in each picture to explain the ideas in the inserted photos. Send your soft copy to the link/email given by your teacher.

RUBRICS FOR THE ACTIVITY

	5	4	3	2	1
Content	Content is accurate and all required information is presented in a logical order.	Content is accurate but some required information is missing and/or not presented in a logical order, but is still generally easy to follow.	Content is accurate but some required information is missing and/or not presented in a logical order, making it difficult to follow.	Content is questionable. Information is not presented in a logical order, making it difficult to follow.	Content is inaccurate. Information is not presented in a logical order, making it difficult to follow.

Slide Creation	Presentation flows well and logically. Presentation reflects extensive use of tools in a creative way.	Presentation flows well. Tools are used correctly. Overall presentation is interesting.	Presentation flows well. Some tools are used to show acceptable understanding.	Presentation is unorganized. Tools are not used in a relevant manner.	Presentation has no flow. No tools used.
Slide Transitions	Transitions are smooth. Transitions enhance the presentation.	Smooth transitions are used on most slides.	Smooth transitions are used on some slides	Very few transitions are used and/or they distract from the presentation.	No transitions are used.
Pictures, Clip Art Background	Images are appropriate. Layout is pleasing to the eye.	Images are appropriate. Layout is cluttered.	Most images are appropriate	Images are inappropriate.	No images
Mechanics	No spelling errors. No grammar errors. Text is in authors' own words.	Few spelling errors. Few grammar errors. Text is in authors' own words.	Some spelling errors. Some grammar errors. Text is in authors' own words.	Some spelling errors. Some grammar errors. Most of text is in authors' own words.	Many spelling and or grammar errors. Text is copied.
	Total 25 pts				



Assessment

Write **T** if the statement is True. If it is false **change the underline** word or group of words that makes it wrong and then write the correct one on the spaces provided.

_____ 1. The required material for the protection or cover in the portion of run's is compatible to cable tray.

_____ 2. Cable tray should be lack of space for maintenance.

_____ 3. It should have permanent warning signs for cable tray with rated over 600 volts' conductors.

_____ 4. Horizontal Elbow is used to change horizontal direction of the cable tray in three directions.

_____ 5. Three are three directions in horizontal wye fittings





Additional Activities

Match Column **A** with Column **B**. Write only the letter of the correct answer on the space provided before the number.

A

_____ 1. It is similar to a wireway unit or assembly of unit and its associated fittings forming a structural system which is used to securely fasten or support cables and raceway.

_____ 2. It is used in general applications and look like a rail way having two sides connected individual.

_____ 3. A cable tray fittings used to bend the direction to 45 °or 135°

_____ 4. A cable tray fitting with three directions the two horizontal connection down to vertical direction or aesthetics look like a funnel.

_____ 5. A cable tray fittings used to join cables in four directions.

B

Horizontal

Cross

Vertical Tee

Horizontal Wye

Ladder Cable
Tray

Reducer

Cable Tray



References

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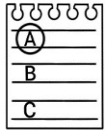
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Electrical Installation and Maintenance NCII – Grade 9
Alternative Delivery Mode
Quarter 1 – Module 2 Part 3: Wireways and Cable Tray
Lesson 3: Cable Tray
First Edition, 2020

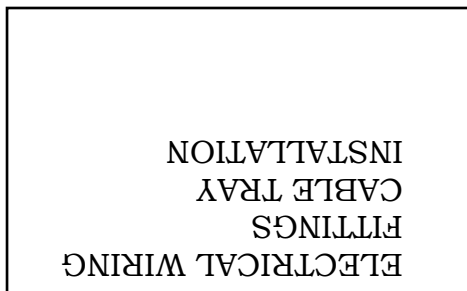


Answer Key

Lesson 3

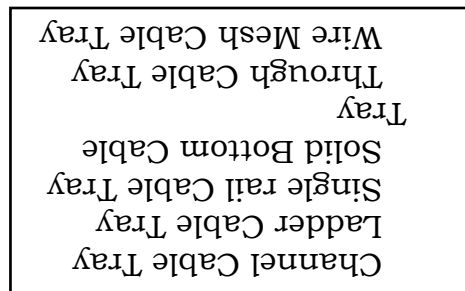
WHAT I KNOW

(JUMBLED LETTERS)



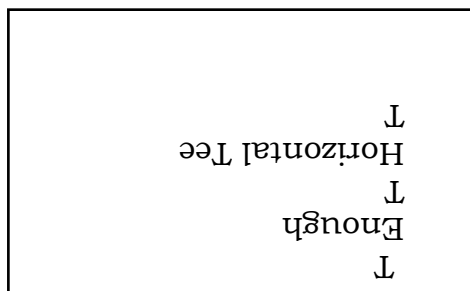
WHAT'S MORE

ACTIVITY 1



ASSESSMENT

(Modified True or False)



Additional Activities





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