

ESTIMATING CONSTRUCTION COSTS

5TH EDITION

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What are the 5 cost estimates followed in construction? There are five main types of construction cost estimates: preliminary, detailed, quantity, bid, and control. Each is used for a different purpose at a different time in a project lifecycle.

How do you accurately estimate construction costs? When creating a construction cost estimation for a project bid, data from the project's construction documents like the design estimate, subcontractor's quotes, quantity takeoffs – material costs, construction processes, direct and indirect costs and your profit margin are used to make a more detailed cost estimate.

What are the levels of construction cost estimating? The American Society of Professional Estimators (ASPE) defines estimate levels in the reverse order as Level 1 – Order (Range) of Magnitude, Level 2 – Schematic/Conceptual Design, Level 3- Design Development, Level 4 – Construction Document, and Level 5 – Bid.>.” ACostE defines a Class I Estimate as definitive, a Class ...

What is a construction estimator? Estimators calculate how much construction projects will cost, taking into account labour, material and equipment requirements. They will negotiate with suppliers and gain quotes from subcontractors and use this information to compile detailed cost proposals for a client.

What is the formula for construction cost? What is the formula to calculate construction cost? To calculate the construction cost, you simply need to multiple your area value by the construction rate per square feet or square metre. The construction rate depends on various factors such as the plot's location, potential cost of labour and raw materials, etc.

What are the five 5 main stages of an estimate?

What is the rule of thumb for labor vs material? Generally, labor accounts for anywhere from 20-35% of total construction expenses, while materials account for 65-80%. However, if more skilled or specialized workers are needed, then the percentage of labor costs could rise as high as 40%.

What is the most reliable estimate in construction? The elemental cost estimate or elemental cost plan is a more accurate method and analysis of construction costs as it is based on further detailed drawings and specifications.

What is the markup on construction estimates? A markup is the amount or percentage you add to the overhead or constructions costs in the invoice of a project. In other words, if the lumber for a project costs you \$10,000, but you charge the client \$11,000, your markup is \$1,000 or 10%. ($\$11,000 - \$10,000 = \$1,000$) or ($\$1,000 / \$10,000 = .10$).

What is a Level 5 construction cost estimate? Level 5 is called a Bid Estimate. This is a contractor's final estimate, based on all available Blueprints, plans, and material costs. This is the definitive estimate ultimately presented to the customer.

What is the most common method of estimating building costs?

How to calculate cost estimation?

How to be the best construction estimator?

How to make a construction estimate?

Is construction estimating hard? Estimating in construction isn't easy. Keep these tips in mind to create accurate estimates, win more jobs and protect your profits. How do you ensure you provide accurate project estimates? This is a question that's tough to answer in any industry, but it's especially difficult in construction.

How to determine building costs? The Rule of Two Method This method is based on the idea that total construction costs are usually split evenly between materials and labor — 50% materials, and 50% labor. That means if you know the price for either materials or labor, you can just double it to get the total estimate.

How do you price construction labor? Finding accurate construction labor cost
Take the total hours worked and multiply this number by the hourly rate (including labor burden) for each worker. If this employee spends 8 hours completing a task, their labor cost will equal \$364 for the task ($\45.5×8).

What is a detailed estimate in construction? Detailed Estimate A detailed estimate is drawn up when there's more information available or the scope of the project is better known. Detailed estimates include incredibly detailed information on quantities, costs and rates—in fact, all items necessary to complete the project.

How to calculate construction cost? The cost of construction depends on the quality of material as well. Higher the quality, the higher the prices. The basic formula to calculate construction cost per square feet is: Cost of construction = area of plot x construction rate per sq ft.

What is the easiest way to estimate? Rounding is the most common way to start estimating. Rounding means to estimate a number to its closest desired digit. Often numbers are rounded to whole numbers to avoid working with decimals or fractions. For example: is rounded down to to make it easier to work with.

What is the most correct method of estimate? Explanation: Detailed estimate: A detailed estimate should have documents such as report, specifications, drawings/plans, design charts and schedule of rates and is the most accurate method of estimating.

What is a Level 5 cost estimate? Class 5 estimates are drawn from inadequate information which is about 0 to 2% of the project definition. The information may be nothing more than a basic description of the plant or process, capacity, and location. That is why its accuracy ranges -50% on the low side and +100% on the high side.

What are cost estimates of construction project? There are several types of construction cost estimates: Preliminary – The idea of the cost based on limited information. Plinth Area – The external dimensions of the structure, including the foundation type, roof construction, materials, and finishes. Cube Rate – The total building volume.

What are the four types of estimates in construction?

What are cost estimates for a project? What is a cost estimate? Project cost estimation is the process of predicting the quantity, cost, and price of the resources required by the scope of a project. Since cost estimation is about the prediction of costs rather than counting the actual cost, a certain degree of uncertainty is involved.

What is energy efficiency of air conditioning systems? A room air conditioner's efficiency is measured by the energy efficiency ratio (EER). The EER is the ratio of the cooling capacity (in British thermal units (Btu) per hour) to the power input (in watts). The higher the EER rating, the more efficient the air conditioner.

What is the EER formula for refrigeration? The EER is computed by dividing the BTUs of cooling energy by the watts needed to power the unit. For example, if you have an air conditioner with 10,000 BTU of cooling energy, and it takes 950 watts to power it, the EER is 10.53. $10000 \text{ BTU} / 950 \text{ w} = 10.53 \text{ EER}$.

What is the most energy efficient HVAC?

What is the most energy efficient refrigerant? R-32 is the most balanced refrigerant in terms of environmental impact, energy efficiency, safety, and cost-effectiveness. Refrigerant is a medium for conveying heat. Air conditioners transfer heat while circulating refrigerant between the indoor and outdoor units.

How do I know if my HVAC is energy efficient? One of the best ways to see if you have an energy-efficient HVAC system is to look for an Energy Star certification. This certification proves that your system is energy efficient. This can help save you money. AC systems that have an Energy Star rating must be at least 14.5 SEER.

What is the energy efficiency rating of HVAC? SEER ratings for air conditioning and air-source heat pump systems manufactured today range from 13 SEER to 24 SEER, with the highest numbers indicating the most efficient units that offer the most energy savings year after year.

What is a good EER rating for an air conditioner? In practice, an EER of 18 for most room air conditioners is extremely energy efficient. Such an AC system would provide 18 BTUs of cooling power for every 1 watt of energy usage. Most room air conditioners are considered highly efficient if they score an EER of 12.

What is the EER of the HVAC system? The Energy Efficiency Ratio (EER) of an HVAC cooling device is the ratio of output cooling energy (in BTU) to input electrical energy (in watts) at a given operating point. EER is normally calculated with a 95 °F outside temperature and an inside (return air) temperature of 80 °F and 50% relative humidity.

How to calculate HVAC efficiency? EER stands for Energy Efficiency Ratio. The EER rating for an air conditioner is calculated by dividing the BTU (British Thermal Units) rating by the wattage. For example, a 12,000-BTU air conditioner that uses 1,200 watts has an EER rating of 10 ($12,000/1,200 = 10$).

What temperature of AC is most energy-efficient? You can also reduce your energy costs significantly by raising the temperature while you are at work, away from home, or asleep. For the greatest savings, consider setting your thermostat to: About 78 degrees while you are at home. About 82 degrees while you are sleeping.

How to make HVAC more energy-efficient?

What makes an HVAC system less efficient? Leaky or Dirty AC Coils Coils are also prone to leakage due to corrosion. Leaking coils cause your system to become undercharged, greatly reducing efficiency. Solution: Coils should be checked a few times a year and cleaned. If they are prone to collecting dust, consider monthly cleaning.

What is the best refrigerant for cold rooms? R404A. If a low to medium temperature refrigerant is required for a cooling process, then R404A should be considered. This is a hydrocarbon blend which can be used in various commercial settings such as supermarkets and cold rooms.

Which one has the highest refrigeration efficiency? Because of its high heat conductivity, low viscosity, high latent heat, low specific volume, and low viscosity, ammonia is the most energy-efficient refrigerant, outperforming any other refrigerant.

What is the best refrigerant for home AC? R-410A: Known by brand names like Puron, R-410A is currently one of the most common refrigerants in newer air conditioners. Unlike R-22, it does not deplete the ozone layer and is considered more environmentally friendly.

Who makes the most efficient HVAC?

Are newer HVAC systems more efficient? How much more energy-efficient are new air conditioners? New models have much higher energy efficiency ratings than your 20-year-old system. If your current AC unit has a SEER rating of ten or lower, you're wasting money while cooling your home. Modern AC systems use significantly less electricity to cool your home.

Does an HVAC system use a lot of electricity? How Much Electricity Does an Air Conditioner Use? Air conditioner usage varies based on the size of your AC. However, generally speaking, a central air conditioner will consume between 3000 and 3500 watts per hour. While window units use between 900 and 1440 watts per hour, portable units consume between 2900 and 4100.

What SEER is considered energy efficient? Seasonal Energy Efficiency Ratio for High SEER AC Units However, if you want to get the most bang for your buck in terms of efficiency, you'll want to look for high-efficiency systems. These are units with SEER ratings over 16 SEER. The best options in terms of high efficiency extend up to about 26 SEER.

Is high efficiency HVAC worth it? In short, high-efficiency HVAC systems are worth it since they can help you save money, reduce emissions, and even improve air quality in the long run. However, they usually have higher upfront costs and may not suit every home ductwork system.

What makes HVAC high efficiency? High-Efficiency Units High-efficient HVAC units are new systems than their predecessors because they've leveraged new technology. High-efficient units operate with exceptional variable compressors because they reduce and adjust the levels of coolness and warmth without necessarily turning on and off.

How to check energy efficiency of air conditioner? $EER\ rating = 18,000\ BTU / 1,400W = 12.86$ Note that the recommended EER rating is at least 14. So if your AC's ratio is higher than that, then it is energy efficient. On the other hand, if your AC had a EER ratio of well below 14, you should consider replacing it with a better AC with a higher EER.

Which AC saves the most energy? A 5-star split AC is significantly more energy-efficient than lower-rated models, such as those with 3 or 4 stars. This efficiency is measured by the Energy Efficiency Ratio (EER), which indicates how much cooling an AC unit provides per unit of electricity consumed.

Is SEER and EER the same? In Summary. Seasonal Energy Efficiency Ratio (SEER) measures how efficiently an air conditioner operates over an entire season, while the Energy Efficiency Ratio (EER) is a standardized measurement of the efficiency of an air conditioner. The higher either ratio is, the more efficient the unit is.

What is the average EER for an air conditioner? If you're wondering what a good EER rating for an A/C unit is, it is 8.5 and above. The higher the rating, the more efficient the A/C unit is. Also, consider looking for the ENERGY STAR label. It indicates that the A/C unit uses 10% less energy to operate.

Can you convert SEER to EER? SEER is a higher value than EER for the same equipment. A more detailed method for converting SEER to EER uses this formula: $EER = 0.02 \times SEER^2 + 1.12 \times SEER$ Note that this method is used for benchmark modeling only and is not appropriate for all climate conditions.

What is HVAC energy efficiency? Energy efficiency in HVAC systems is about maximizing the performance of heating, ventilation, and air conditioning units. It aims to optimize operations to reduce energy consumption without compromising indoor air quality, temperature, humidity, or pressure levels.

What is good efficiency for an AC unit? An air conditioner with a SEER rating of over 13 is generally regarded as high efficiency, but this depends on the size of the space you're cooling and your own personal cooling preferences.

What is a good EER rating for an air conditioner? In practice, an EER of 18 for most room air conditioners is extremely energy efficient. Such an AC system would provide 18 BTUs of cooling power for every 1 watt of energy usage. Most room air conditioners are considered highly efficient if they score an EER of 12.

What is the most energy efficient setting for air conditioning? But is there an ideal temperature setting for your thermostat during warmer months that is both

comfortable and energy efficient? Yes! The ideal temperature setting for your AC during warmer months is actually 78 degrees.

What is energy efficient HVAC system? What Is HVAC Energy Efficiency? Energy efficiency in HVAC systems is about maximizing the performance of heating, ventilation, and air conditioning units. It aims to optimize operations to reduce energy consumption without compromising indoor air quality, temperature, humidity, or pressure levels.

Is it worth going from 14 SEER to 16 SEER? A 16 SEER unit is about 13% more efficient than a 14 SEER. For every \$100 you spend to cool your home with a 14 SEER, you could save \$13 on your monthly bill by upgrading to the 16 SEER unit. But just like gas mileage, your ability to meet this maximum efficiency and savings depends on a lot of other factors.

Is it worth paying for higher SEER? Air conditioners with high SEER ratings are more energy efficient than older models, and they can save you money on your utility bills. There are a few features that contribute to a high-efficiency rating.

Is high-efficiency HVAC worth it? In short, high-efficiency HVAC systems are worth it since they can help you save money, reduce emissions, and even improve air quality in the long run. However, they usually have higher upfront costs and may not suit every home ductwork system.

What is more important SEER or EER? SEER is the more commonly used measurement for energy efficiency, as it takes into account the efficiency of the system over a range of temperatures and humidity levels. EER is useful for comparing the efficiency of systems at a specific temperature, such as in a hot and dry climate.

Which is most energy efficient AC?

How to check energy efficiency of air conditioner? $EER\ rating = 18,000\ BTU / 1,400W = 12.86$ Note that the recommended EER rating is at least 14. So if your AC's ratio is higher than that, then it is energy efficient. On the other hand, if your AC had a EER ratio of well below 14, you should consider replacing it with a better AC with a higher EER.

How cool should my house be if it's 100 outside? Consider setting your thermostat at 75 degrees to 80 degrees in your home if the outside temperature is approaching triple digits. If you set your thermostat to much lower than the upper 70s, you could hinder the operation of your air conditioner and increase your energy costs.

What is the best AC temperature to save electricity bill? The Goldilocks Zone Experts suggest that the optimal AC temperature is around 78°F (25.5°C) during the summer months. This temperature keeps you cool without overburdening your energy consumption. It's like the Goldilocks zone – not too hot, not too cold.

Is 72 too cold for AC? When setting your thermostat, most homeowners find 72 is a good temperature for air conditioning. However, you may need to adjust that setting based on weather conditions. The bigger the difference between indoor and outdoor temperatures, the higher your energy bill will be.

How can I make my HVAC system more energy-efficient?

What is the best rated HVAC system 2024? Trane is the best overall HVAC company on Forbes Home's best HVAC companies list, with Carrier taking the win for reliability, Lennox for energy efficiency and Rheem for affordability.

What is the best HVAC brand?

What Kinesis tool is used to create and stream data? Amazon Kinesis Firehose
Kinesis Firehose is used to reliably load large-scale streaming data into data lakes, data sources, and analytics services. Firehose can ingest, process, and deliver streaming data to any number of endpoints and services.

What is Kinesis data stream in AWS? Amazon Kinesis Data Streams is a serverless streaming data service that simplifies the capture, processing, and storage of data streams at any scale.

What is streaming data in AWS? Streaming data is data that is emitted at high volume in a continuous, incremental manner with the goal of low-latency processing. Organizations have thousands of data sources that typically simultaneously emit messages, records, or data ranging in size from a few bytes to several megabytes

(MB).

Which of these AWS services is recommended to handle streaming data in AWS? Amazon Data Firehose is the easiest way to load streaming data into AWS. It can capture, transform, and deliver streaming data to Amazon S3, Amazon Redshift, OpenSearch Service, generic HTTP endpoints, and service providers such as Datadog, New Relic, MongoDB, and Splunk.

How do I create a data stream in Kinesis?

What is the difference between Kinesis data stream and Kafka? Performance-wise, Kafka has a clear advantage over Kinesis. Let's not forget that Kafka consistently gets better throughput than Kinesis. Kafka can reach a throughput of 30k messages per second, whereas the throughput of Kinesis is much lower, but still solidly in the thousands.

When to use AWS kinesis?

What are the benefits of Kinesis in AWS? Benefits of using Kinesis Data Streams Data is put into Kinesis data streams, which ensures durability and elasticity. The delay between the time a record is put into the stream and the time it can be retrieved (put-to-get delay) is typically less than 1 second.

How do you put data into Amazon Kinesis data stream? To put data into the stream, you must specify the name of the stream, a partition key, and the data blob to be added to the stream. The partition key is used to determine which shard in the stream the data record is added to. All the data in the shard is sent to the same worker that is processing the shard.

What is a data streaming solution? Also known as event stream processing, streaming data is the continuous flow of data generated by various sources. By using stream processing technology, data streams can be processed, stored, analyzed, and acted upon as it's generated in real-time.

Which AWS service is used for streaming? The CloudFront distribution delivers your live stream to viewers with low latency and high transfer speeds. An S3 bucket stores the CloudFront logs. AWS Elemental MediaLive, ingests an input feed and transcodes your content into one adaptive bitrate (ABR) HTTP Live Streaming (HLS)

stream as output.

What is an example of streaming data? Examples of Streaming Data The most common use cases for data streaming are streaming media, stock trading, and real-time analytics. However, data stream processing is broadly applied in nearly every industry today.

What is AWS Kinesis data stream? Amazon Kinesis Data Streams is a serverless streaming data service that makes it easy to capture, process, and store data streams at any scale.

When to use Kinesis data streams vs firehose? Kinesis Data Streams: Best for applications requiring real-time analytics, complex processing, or temporary data storage. Kinesis Firehose: Ideal for simple, real-time data delivery needs without the necessity of storage or complex processing.

What is Kinesis firehose in AWS? Amazon Data Firehose is the easiest way to capture, transform, and deliver data streams into Amazon S3, Amazon Redshift, Amazon OpenSearch Service, Splunk, Snowflake, and other 3rd party analytics services. The name change is effective in the AWS Management Console, documentation, and service web pages.

Is Kinesis data stream real-time? Amazon Kinesis is a managed service provided by AWS for real-time data streaming. Kinesis provides capabilities to continuously capture and store terabytes of data per hour from hundreds of thousands of sources. The data can then be processed and analyzed in real-time.

How long does Kinesis data stream store data? A Kinesis data stream stores records from 24 hours by default, up to 8760 hours (365 days).

What is an Amazon Kinesis data stream a set of? A Kinesis data stream is a set of shards. Each shard has a sequence of data records. Each data record has a sequence number that is assigned by Kinesis Data Streams.

Is Kinesis data stream push or pull? Kinesis Data Streams pushes the records to you over HTTP/2 using `SubscribeToShard`.

Can Kinesis replace Kafka? Both Kafka and Kinesis offer cost-effective, scalable, and low-latency streaming options. As a managed solution, Kinesis is better suited for small teams that have very little or no DevOps capacity, whereas the open-ended configurability of Kafka is better suited for larger teams with more complex streaming needs.

What is the replacement of Kafka in AWS? Multiple producers and consumers can publish and retrieve messages at the same time. Q: What is the AWS equivalent of Kafka? A: There are multiple products in the AWS cloud that can provide similar Pub/Sub functionality to Kafka, including Kinesis Data Streams, Amazon MQ, Amazon MSK, and Confluent Cloud.

What is Kinesis data firehose used for? Kinesis Firehose is used to LOAD streaming data to a target destination (S3, Elasticsearch, Splunk, etc). You can also transform streaming data (by using Lambda) before loading it to destination. Data from failed attempts will be saved to S3.

What is the tool that can be used to check for data stream? Google Cloud DataFlow Google has created its cloud-based streaming analytics tool. It is part of the services provided by the Google Cloud platform. It is built on Apache Beam, a unified programming model for batch and streaming data processing.

What is Kinesis data generator? The Amazon Kinesis Data Generator is a UI that simplifies how you send test data to Amazon Kinesis Streams or Amazon Kinesis Firehose. Using the Amazon Kinesis Data Generator, you can create templates for your data, create random values to use for your data, and save the templates for future use.

How do I create a Kinesis delivery stream? Open the Amazon Kinesis services console . Choose Firehose and then choose Create delivery stream. On the New delivery stream page, for Delivery stream name, enter ticketUploadStream , and then choose Next. On the Process records page, choose Next.

What is the mechanics of materials in mechanical engineering? Mechanics of materials is the study of a material's response to a physical stressor. Generally, this is assumed to pertain to the study of how materials fail. However, this can also

pertain to nonfailure experiments and analyses [1].

What is the mechanics of materials analysis? Mechanics of materials focuses on quantitative description of the motion and deformation of solid materials subjected to forces, temperature changes, electrical voltage or other external stimuli.

What is the subject of mechanics of materials? We focus on understanding and predicting the deformation and failure behaviour of a range of materials from metals, ceramics, polymers and composites to adhesives and soft solids.

What is the subject of mechanics in mechanical engineering? What is Engineering Mechanics? Engineering Mechanics is a subject that deals with the principles, calculations, and laws of Forces; along with their applications to Mechanical Engineering problems. Engineering Mechanics is used to solving real-life designing, analyzing, and constructing things.

How hard is mechanics of materials? Mechanics of Materials: Also known as Strength of Materials, this course covers the response of solid materials when exposed to various forces and loads. Students can have a hard time with this class due to the complex stress-strain relationships and deriving or applying equations to various loading scenarios.

How do I prepare for mechanics of materials? A solid understanding (pun intended?) of statics and calculus is necessary to properly learn and grasp the concepts of solid mechanics. In order to gain a comprehensive understanding of the subject, you should start at the top and work your way down the list.

What 4 basic concepts are required for the study of mechanics?

What are the four important mechanical properties of material? Mechanical properties are also used to help classify and identify material. The most common properties considered are strength, ductility, hardness, impact resistance, and fracture toughness. Most structural materials are anisotropic, which means that their material properties vary with orientation.

What are the three fundamentals of mechanics? The fundamental dimensions used in mechanics are time, mass, and length. Symbolically, these are written as t , m , and l , respectively.

What is another name for the mechanics of materials? The field of strength of materials (also called mechanics of materials) typically refers to various methods of calculating the stresses and strains in structural members, such as beams, columns, and shafts.

Why do we study mechanics of materials? Mechanics of Materials (also known as stress analysis) provides techniques by which engineers can predict stress and strain distributions resulting from known loading conditions so that the stability and strength of structural members and machine components under load can be assessed.

What are the three branches of mechanics?

What are the 5 major topics in Engineering Mechanics? Computational mechanics, Contact mechanics, Continuum mechanics, Dynamics (mechanics), Elasticity (physics), Experimental mechanics, Fatigue (material), Finite element method, Fluid mechanics, Fracture mechanics, Laws of Mechanics, Quantum Mechanics, statics; these are some of the major topics of engineering mechanics.

What is taught in mechanics? Mechanical engineering majors learn about motion and energy, and they study fluid, solid and thermal mechanics. They spend time in labs, where they develop problem-solving skills and evaluate and design products. These products can range from prosthetics to machine parts and car engines.

What is the difference between mechanical engineering and mechanics? Mechanics make sure everything we use works correctly, while mechanical engineers design these things and bring new ideas to life. Both jobs are important for different reasons: mechanics keep our daily machines running, and engineers innovate and create the technologies of the future.

What is the mechanics of materials also known as? The field of strength of materials (also called mechanics of materials) typically refers to various methods of calculating the stresses and strains in structural members, such as beams, columns, and shafts.

What is the meaning of mechanics in mechanical engineering? Mechanics (from Ancient Greek: ~~μηχανική~~, *mēkhanikē*, lit. "of machines") is the area of physics

concerned with the relationships between force, matter, and motion among physical objects. Forces applied to objects result in displacements, which are changes of an object's position relative to its environment.

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What is mechanical engineering with a specialization in mechanics of materials? The specialization in mechanics of materials is designed for students who are interested in gaining expertise in the areas of mechanics of solid and soft materials, and the dynamics of material systems (e.g., bioinspired systems and metamaterials), including applications to engineering structures and devices, ...

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