

DOWNLOAD PDF UNIT PRICE ESTIMATING METHODS (MEANS UNIT PRICE ESTIMATING METHODS)

Chapter 1 : Estimating | WBDG Whole Building Design Guide

Unit Price Estimating Methods Item# B This comprehensive reference explains everything you need to know about taking off and pricing detailed, unit price construction estimates.

A good estimator should possess the following qualifications: A thorough understanding of architectural drawings. A sound knowledge of building materials, construction methods and customs prevailing in the trade. A fund of information collected or gained through experience in construction work, relating to materials required, hourly output of workers and plant, overhead expenses and costs of all kinds. An understanding of a good method of preparing an estimate. A systematic and orderly mind. Ability to do careful and accurate calculations. Ability to collect, classify and evaluate data that would be useful in estimating. Good instruction or careful and thorough study of a standard book will help a beginner to become a good estimator. He must, however, try to develop all the above mentioned qualities while obtaining practical experience. In order to prepare a detailed estimate the estimator must have with him the following data: Plans, sections and other relevant details of the work. Specifications indicating the exact nature and class of materials to be used. The rates at which the different items of work are carried out. To enable an estimator to take out the quantities accurately, the drawings must themselves be clear, true to the fact and scale, complete, and fully dimensioned. The estimator has also to bear in mind certain principles of taking out quantities. There are three clearly defined steps in the preparation of an estimate. Taking out quantities In the first step of taking out quantities, the measurements are taken off from the drawings and entered on measurement sheet or dimension paper. The measurements to be taken out would depend upon the unit of measurement. For example, in the case of stone masonry in superstructure, length, thickness and height of the walls above plinth level would be taken out from the drawings and entered on the measurement sheet, whereas, in the case of plastering only the lengths and heights of the walls would be entered. Obviously, the unit of measurement in the first case is cubic meter and that in the second case is square meter. Squaring out The second step consists of working out volumes, areas, etc. Abstracting In the third step all the items along with the net results obtained in the second step are transferred from measurement sheets to specially ruled sheets having rate column ready for pricing. The second and third steps above are known as working up. All calculations in these stages and every entry transferred should be checked by another person to ensure that no mathematical or copying error occurs. Standard Method of Measurement of Building Works: The different methods of measuring used by various Central and State Government departments and by construction agencies were found to be a serious difficulty to estimators and a standing cause of disputes. For this reason a unification of the various systems at the technical level had been accepted as very desirable and wanting. Although the standard has no legal sanction and as such need not be adopted unless it is referred to in the contracts. Principles of Deciding Unit of Measurement: A beginner may find it difficult to remember the units of measurement of different items. Memorizing of units of measurement would be greatly simplified if he knows the principles kept in view while selecting the units of measurements. Following are the most important principles of selection of unit of measurement: The unit of measurement should be simple and convenient to measure, record and understand. It should be one, which provides for fair payment for the work involved. In the result it should yield quantities, which are neither too minute nor too large. The price per unit should not be a very small figure or a very large one, that is, generally costlier items will be measured in smaller units, cheaper ones in larger units. For example, stone masonry is measured in cubic meters because raw materials are measured in cubic meters plastering or pointing is measured in square meters, as the labor is considerable. End of Article -.

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Chapter 2 : means_unit_price_estimating_methods

This updated edition provides authoritative guidance for preparing accurate estimates, and covers every step of the estimating process from receipt of the plans, to quantity takeoffs and pricing, to bidding strategies and project cost control.

Construction costs for large construction projects are usually forecast before any work commences. Private and public construction clients prefer to know the detailed costs of a project, and their required financial commitment, before the in-depth project design work has been completed. Different cost-planning methods exist, and the unit method is one of the most common methods of construction cost planning in use. Cost Planning Cost planning is one of the methods used to estimate the costs for construction projects. It is used for both public and private projects. Cost planning is performed during the planning and evaluation phase of a project. Unit Method The unit method involves the use of a single functional unit that serves as a multiplier. Historical data from previous, similar construction projects is used to build a cost model of construction costs for one new unit. This unit is then multiplied by the number of units necessary to complete the project, which provides an overall cost estimate. A functional unit may be bedroom in a hotel, the cost per student for a school or cost per bed for hospitals. Some project cost models may use a cost per square foot, based on historical costs for other projects. The estimated costs to build 1 square foot are multiplied by the planned square footage for all floors in the building. This method does not deduct costs for elevators, stairwells and internal walls, which creates some inaccuracy. Issues with Cost Planning The cost planning method is used mostly for public projects. For both public and private projects, the method is useful only in the early stages of defining the construction project. It works best when used as a rough estimate before much design work has been completed. The unit method produces a rough estimate. The method makes it difficult to allow additional costs for factors such as the size and shape of a building and differences in materials and finishes used on a particular project. Errors happen during the estimating procedure, such as use of inaccurate pricing, availability of price information and appropriate pricing methods. Design changes and incomplete data, such as erroneously omitted items or incorrect dimensions, also affect the output. Poor judgment on the part of the estimator, such as overlooking certain cost items or not planning for waste parts, are part of the human error that affects accuracy. Uncertainties due to weather, delays in construction, policies on supervision, different construction methods, economic and political issues, changing construction technology, availability of equipment and materials and differences in labor productivity are some of the external influences that may affect the accuracy of cost estimates. She brings more than 20 years of experience in corporate finance and business ownership. Gaffney holds a Bachelor of Science in finance and business economics from the University of Southern California.

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Chapter 3 : Unit Method of Cost Planning | www.nxgvision.com

This comprehensive reference explains everything you need to know about taking off and pricing detailed, unit price construction estimates. The book takes you through every step of the estimating process – from receipt of the plans, to detailed quantity takeoffs and pricing, to bidding strategies, and finally, cost control.

Once an initial budget has been established, it is important to test its assumptions by employing a series of increasingly precise cost estimating techniques that coincide with further development of design and construction details. A sound understanding of the most common types of estimates, tools for estimating, historical database sources, and formats of estimates forms the basis of the more sophisticated methods of estimating. Estimating is typically concerned with the initial costs—or first costs—of accomplishing new construction or renovation projects, although it also plays a large part in life-cycle costing of design alternatives. The estimates should be provided by a professional estimating firm either as part of the design team, or directly for the owner. In many instances the latter is preferred to ensure the independence of the estimate.

Estimating Formats A key component of any cost-estimating effort is to establish the framework, or format, within which the project costs will be distributed, often referred to as a Work Breakdown Structure (WBS). There are a variety of estimating formats used today, but the two most commonly used are MasterFormat and Uniformat. Uniformat represents WBS costs according to a hierarchy of system elements, and is supported through various organizations, e. Although different in their system headings, each provides a hierarchical WBS by systems. On the other hand, MasterFormat-based estimating is often used in providing planning stage and early design phase estimating, where take-off measurements do not readily allow MasterFormat databases to be applied. In either case, the key to successful estimating is whether accurate cost data is available through databases or other sources that enable WBS quantities to be applied.

Types of Estimates Preliminary Estimates. Early in the planning stages, both building owners and designers must agree on an anticipated cost of the project at bid award. The WBS recommended at this stage is a systems-based format, where elements of the building e. Estimate comparisons at this stage are especially valuable in evaluating the feasibility of strategic alternatives being considered to satisfy current and projected space requirements e. Issues which need to be identified at this juncture include method of procurement being considered, location market factors, specific site constraints or challenges, proposed phasing plans, and start and finish dates. It is recommended that a formal risk analysis be carried out at every stage in the design, but particularly in the planning stage when proactive steps can be taken to mitigate identified risks. After proceeding with a preferred course of action, Intermediate Estimates are employed at various stages of project design development to maintain accountability for initial budget projections and as a means of evaluating competing alternative construction assemblies, systems, and materials. On large projects it is common practice for an owner to employ a construction manager or professional estimator to continually update project estimates and provide feedback on budget impacts of decisions on major design elements. The risk assessment should be updated and a contingency factor calculated depending on the outcome of the risk analysis. As the design progresses and risks are mitigated, the design contingency can typically be reduced. Many owners employ Earned Value Analysis cost management practices as the design progresses, to determine if the project is on track according to both schedule and budget. This can be as straightforward as tracking costs across building systems e. As the design is completed a detailed pre-bid estimate can be prepared. At this stage the design contingency would typically be reduced to zero: This then allows for a comparison of the final estimate with the bids received and can aid in negotiating with the lowest bidder. In addition, having the final estimate and bids in the same format facilitates developing cost databases for use in planning future projects.

Estimating Methods There are four primary methods used to estimate construction costs. Each method of estimating offers a level of confidence that is directly related to the amount of time required to prepare the estimate Fig. Project Comparison Estimating or Parametric Cost Estimating is often used in early planning

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stages when little information is known about the program other than overall project parameters. Project comparison estimating uses historical information on total costs from past projects of similar building type. For example, the number of beds in a hospital, or number of spaces in a parking garage, or number of courtrooms in a courthouse can form the basis of a project comparison estimate by comparing them to similar scope projects recently done in the same geographic region. This estimating method requires the assumption of an approximate gross area for the proposed work and a sufficient historical record of similar building types. The greater the number of prior project combinations for which scope and prices are known, the easier it is to perform Project Comparison Estimating. B illustrates an example of regression analysis used to develop a project comparison estimate. The scattered points in the figure show the combinations of overall project size and cost. The line shown is the "best fit" of a linear relationship between size and construction cost and may serve to predict a preliminary budget. The distances between the line and the points give a visual impression of the statistical confidence of the estimate. Relative accuracy of estimate types. From Concept to Bid Successful Estimating Methods by John D. Project relative accuracy of estimate types. Bledsoe Square Foot and Cubic Foot Estimates are another method of developing both preliminary and intermediate budgets based on historical data. This method is effective in preparing fairly accurate estimates if the design is developed enough to allow measurement and calculation of floor areas and volumes of the proposed spaces. More accurate estimates made with this method make adjustments and additions for regional cost indices, local labor market rates, and interpolation between available cost tables. Further adjustments may be made to account for other unique aspects of the design such as special site conditions or design features being planned. In addition, the estimate can develop overall "core and shell" costs along with Tenant Improvement build-out costs of different space types, allowing for relative ease of determining the impact of changes to the program. For example, a foundation usually requires excavation, formwork, reinforcing, concrete—including placement and finish—and backfill. An Assembly and Systems estimate prices all of these elements together by applying values available in assemblies cost data guides. In Unit Price and Schedule Estimating, the work is divided into the smallest possible work increments, and a "unit price" is established for each piece. That unit price is then multiplied by the required quantity to find the cost for the increment of work. This calculation is often called "extending". Finally, all costs are summed to obtain the total estimated cost. For example, the cost to erect a masonry wall can be accurately determined by finding the number of bricks required and estimating all costs related to delivering, storing, staging, cutting, installing, and cleaning the brick along with related units of accessories such as reinforcing ties, weep-holes, flashings, and the like. This method of estimating provides the most accurate means of projecting construction costs, beyond which accuracy is more likely to be affected by supply and demand forces in the current market. Historical Databases and Estimating Software There are several historical databases available that provide current values for estimating costs of the various units of work for a project. The databases are compiled from records of actual project costs, and on-going price quotations from suppliers, and are published annually in the form of books, CDs, and computer-based extranets. There is however a danger of applying published data or software database pricing without first adjusting for the particular aspects of the project under consideration. In construction every project is unique, with a distinct set of local factors such as size of project, desirability, level of competition, flexibility of specifications, work site, and hour restrictions, and so forth that come into play in bidding. When an estimating system is used that is attached to a price database, the professional estimator should still review each line item price to determine if it is applicable to the project being estimated. Blindly applying database prices can lead to inaccurate estimates and bid busts. Location factors should also be applied only after first considering the project size and particular nature, to determine where the bidders will come from. If it is a large project in a small town, the location factor for that town likely will not apply as the bidders will be coming from elsewhere. The bids may as a result be much higher than the factor would indicate as the wages will be based on another location and the bidders may have to pay accommodation and travel costs for some of their workers. Means — The most-used and most-quoted source with 25 different guides and unit prices for

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over 20, building components. Army Corps of Engineers – A multi-user software program used for preparation of detailed construction cost estimates for military, civil works, and government facilities.

Chapter 4 : Construction Cost Estimating : Approximate and Detailed Methods

This comprehensive reference explains everything you need to know about taking off and pricing detailed, unit price construction estimates. The book takes you through every step of the estimating process – from receipt of the plans, to detailed quantity takeoffs and pricing, to bidding strategies, and finally, cost control.

Chapter 5 : Unit Price Estimating - RSMeans Training -

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Chapter 6 : Unit Price Estimating Methods | RSMeans Reference Books

The National Shipbuilding Research Program october nsrp # the national shipbuilding research program basic principles of industrial engineering u.s. department of transportation maritime.