



U.C.P. ENGINEERING SCHOOL

ESTIMATION AND COSTING



By: Er. Pramila Kumari Gouda
Lecturer , department of civil
engineering

UNIT I

ESTIMATE OF BUILDINGS

Introduction to estimation- Necessity of Estimation- Units and Measurements-Types of Estimates.

- Methods of Estimation-Load bearing and framed structures Calculation of quantities of brick work, RCC, PCC, Plastering, white washing, colour washing and painting / varnishing for shops, rooms, residential building with flat and pitched roof – Various types of arches – Calculation of brick work and RCC works in arches – Estimate of joineries for panelled and glazed doors, windows, ventilators, handrails etc.- Estimation of Steel for RCC works.

General

Estimating is the technique of calculating or computing the various quantities and the expected Expenditure to be incurred on a particular work or project. In case the funds available are less than the estimated cost the work is done in part or by reducing it or specifications are altered, the following requirements are necessary for preparing an estimate. Drawings like plan, elevation and sections of important points. Detailed specifications about workmanship & properties of materials etc. Standard schedule of rates of the current year.

UNITS OF MEASUREMENTS

The units of measurements are mainly categorized for their nature, shape and size

and for making payments to the contractor and also. The principle of units of

measurements normally consist the following:

- Single units work like sanitary fittings, Electrical points, electrical appliances, etc., is expressed in numbers. Works consists linear measurements involve length like cornice, fencing, hand rail, pipe length with details, bands of specified width and skirting etc., are expressed in running meters (RM)
- Works consists areal surface measurements involve area like plastering, white washing, partitions of specified thickness, glass of specified thickness, flooring upto the thickness of 40mm, Tiles flooring, wall tile finishing, painting of doors and windows, A.C Sheet roofing, Weathering tiles, Doors and windows shutter with required specifications, Half brick work, Honey comb Brick work, Brick on edge work etc., are expressed in square meters (m²)
- Works consists cubical contents which involve volume like earth work, Earth fill, cement concrete, Masonry etc are expressed in Cubic metres. Steel for RCC works is expressed in Killo gram, Kilonewton or tonne.

Importance of Estimating and Costing

1. The estimate is necessary for fixing the budget for the purposed project.
2. It is necessary for calculating the required quantities of materials and laborers for the project.
3. It is necessary to draw up a work schedule.
4. It is necessary to fix up the completion period of the proposed project.

5. It is also helpful to check the works done by contractors during and after the execution.
6. It is required for preparing tenders for the project.
7. It is necessary for the valuation of land and building.

Estimated cost and the actual cost

The estimated cost is the anticipated or probable cost of the work and is usually prepared before the construction is taken up.

The actual cost is the cost which is known only after the completion of the work from the account of the completed work.

Purpose of Estimating

1. To estimate the probable cost of the work.
2. To find the various types and quantities of material required.
3. To find the various categories and quantities of labors required.
4. To give an idea of the time required for the completion of the work.
5. To justify investment from benefit-cost ratio.
6. To help in fixation of standard rent and valuation of properties.

Data required for estimating

1. Drawing i.e. plans, elevation, sections, etc.
2. Specifications
3. Rates
4. Methods of measurement

1) Plans: Drawings are required for the calculation of the quantities of the materials. The drawings showing plans, [elevation](#), different section and other relevant detail with clear and complete dimensions are very essential before preparing an estimate.

2) Specifications: Specification describes the nature and class of the work, materials to be used, workmanship and is very important for the execution of work.

3) General specifications: This gives a general idea about the nature, class and materials in general terms to be used in various types of work.

4) Detailed specification: It gives a detailed description of the various items of work laying down the quantities and quantities of materials, method of preparation, their proportions, workmanship, and execution of work.

5) Rates: Rates are essential for the computation of estimates by multiplying quantities of materials with unit rates. The unit rates of each item of work are required for preparing an estimate. Unit rates of each item arrive from:

- In the construction, the rates of various materials are used
- The cost of transport materials.
- The wages of labor.

6) Methods of measurement: Updated mode of measurement for standard deductions or additions are also necessary to determine the correct quantities of work.

Methods of taking out Estimating and Costing:

The calculations of quantities of materials can be done using various methods of estimates. The application of individual methods is as upon the design and shape of the building. The different methods are as follows:

1. **Centreline** method: This method is used mostly if the offsets are symmetrical and the building is more or less rectangular in shape. This centerline acts as length for the complete calculations of the estimate. If the deductions not cared for the results of estimates may be wrong. All the walls should have the same section.
2. **Crossing Method:** The lengths and breadths of the masonry walls at the plinth level are taken (internal dimension of the room + thickness of the walls) for calculating quantities. The symmetrical offset as much as in the case of the centerline method. The centerline length is obtained by calculating the overall perimeter of the building and subtracting the four times the thickness of the wall on it.
3. **Out to Out and Into In (Long wall and Short wall) Method:** In this method, the wall along the length of the room is considered to be a long wall while the wall right-angled to longwall is said to be the short wall. To determine the length of the longwall or short wall, calculate first the centerline lengths of individual walls. Then the length of longwall (out to Out) may be determined, after adding half breadth at each end to its centerline length. Thus the length of the short wall is measured by deducting half breadth from its centerline length at each end.
4. **Bay Method:** This method is generally followed in the case of the building having several bays. The cost of the one classroom is worked out and then multiplied by the number of bays in that

building which gives the total cost of the building. The extra cost is required for the end walls and differences in framing.

Types of Estimating

The different types of the estimate are as follows:

1. Preliminary or approximate or rough estimate
2. Plinth area estimate
3. Unit rate estimate
4. Cube rate estimate
5. Item rate estimate
6. Detailed estimate
7. Revised estimate
8. Supplementary estimate
9. Annual repair estimate and annual maintenance estimate
10. Complete estimate
11. Extension and improvement estimate

the single roomed building (Load bearing type structure) by long wall & short wall method

Centre Line Method

