

ESTIMATING AND COSTING

Unit conversion:

1 Feet=12inch

1 feet=0.3048meter

1inch=25.4mm

1meter=1000mm

1meter=3.281 feet

1meter=1.094 yard

1cft =0.028 m³

1meter square=10764 ft²

1acre=43560 ft²

1acre=100 m²

1 square foot=0.093 m²

1 acre=40 guntha

1 guntha= 33ft*33ft

1bag cement= 50kg

1bag of cement=0.0347 m³

No cement bags required for 1m³=28.8

INTRODUCTION TO ESTIMATION

Introduction:

For all engineering work it is required to know beforehand the probable cost of construction known as estimated cost which is determined theoretically by mathematical calculations based on the plan, drawing and current rates.

1) State the meaning of the term estimating and costing.

Ans: Estimating: An estimate is the anticipated or probable cost of work and is usually prepared before the construction is taken up. It is indeed calculations or computations of various items of an engineering work.

2) State the purposes of estimating and costing.

Purpose of Estimating

- Ans:
- 1) To know the approximate cost of proposed work.
 - 2) To obtain administrative approval and technical sanction.
 - 3) To know the requirement of tools, plants and equipment.
 - 4) To fix up the completion period.
 - 5) To draw up a construction schedule and programme.
 - 6) To know value of property.
 - 7) To invite tender.
 - 8) To keep control over expenditure during construction

3) State different types of estimates

- Ans:
1. Preliminary or Approximate or Rough Cost Estimate
 2. Plinth Area Estimate.
 3. Cubic Contents Method
 4. Approximate Quantity Method
 5. Detailed Estimate (or Item Rate Estimate)
 6. Revised Estimate
 7. Supplementary Estimate
 8. Supplementary and Revised Estimate
 9. Annual Repair (A.R) or Annual Maintenance (A.M.)

1. Preliminary or Approximate or Rough Cost Estimate.

- This estimate is prepared on the basis of practical experience of carrying out similar works in the past and their rates.
- In this estimate, the approximate cost of all important works such as cost of land, roads, buildings, water supply, sanitary works, electrification etc. are mentioned separately.
- This approximate estimate is prepared for preliminary studies of the various aspects of the work and also to decide the financial position and policy for administrative approval by competent sanctioning authority.

2. Plinth Area Estimate.

- As the name implies, this estimate is prepared by taking external dimensions of the building at the plinth.
- The area of courtyards and other open areas are not to be included while calculating the plinth area.
- Plinth area estimation is calculated by multiplying the plinth area of the proposed building by the plinth area rate.
- The plinth-area method of preparing estimate gives the approximate cost of the building to be constructed.

3. Cubic Contents Method.

- The cubic content method is an approximate method of preparing an estimate of a proposed building.
- Knowing the cubic content rate of recently constructed building having similar specifications in the locality, the approximate cost of the proposed building is worked out by multiplying the total cubic contents by its cubic content rate.
- In order to calculate the cubic contents of the building, the length and breadth are measured as the external dimensions at the floor level and the height of the building is measured.
- The cubic content method is more accurate as compared to plinth area method as it accounts for the height of the building.

4. Approximate Quantity Method

- The cost per running meter of foundation inclusive of plinth is worked out and is multiplied by the total length of foundation to determine the total cost of foundation inclusive of plinth.
- Similarly, the cost per running meter of the superstructure is found out and is multiplied by the total length of all the walls of superstructure to get the total cost of superstructure.

5. Detailed Estimate (Or Item Rate Estimate):

- This is the accurate method of estimating in which the entire building work is subdivided into individual items of work.
- The quantities of each item of works are calculated from the complete set of drawings (i.e. plan, elevation, sections etc.)
- The abstract of the estimated cost is prepared by multiplying the quantities of each of the above items by the rate of the completion of that item.
- The rates of various items of work can be obtained from the 'schedule of rate' prepared by the Government organization.
- In order to make provision for unforeseen expenditure for miscellaneous petty items (for which no provision is made in the estimate) and contingencies a
- 3 to 5% of the estimated cost is added to it.
- An additional 1.5% to 2% is also provided for the work-charged establishment i.e. for the salaries to be paid to the chawkidars, technical assistants, supervisors etc. appointed by the Government (or owner) to look after the work.
- The grand total of all the above cost is known as the total estimated cost of the proposed work.

Sl. No.	Particulars of Work	Numbers (N)	Length (L)	Breadth (B)	Height or Depth (H)	Quantity $Q = NLBH$	Unit of Measurement

Abstract estimation

Sl. No.	Particulars of Work	Quantity (Q)	Unit	Rate Per Unit (R)	Cost $C = QR$

6. Revised Estimate:

It is also a detailed estimate and is to be prepared when:

- The original sanctioned amount of estimate exceeds by more than 5%.
- When a expenditure on a work exceeds or amount spent on the work exceeds administratively sanctioned amount more than 10%.
- When there is material deviation from the original proposal.

The revised estimate is accompanied by a comparative statement in the prescribed format indicating the changes in each item of works, its rate and amount as per original and revised with full justification for such variations and excess etc.

7. Supplementary Estimate:

- It is a fresh detailed estimate which is to be prepared when additional works are required to supplement the original proposed work or when further development or extension of the work is required to be carried during progress of the work.
- The abstract must indicate the original amount of the estimate and the total amount including supplementary amount for which fresh sanction is to be obtained.

8. Supplementary and Revised Estimate:

- This estimate is prepared when a particular work is abandoned and the cost of the work remaining is less than 95% of the original sanctioned amount of the work
- or where there are material deviations from the original proposed work which may result in substantial saving in the estimate.
- In such cases a fresh supplementary and Revised Estimate is to be prepared and sent for revised technical sanction.

9. Annual Repairs (A.R.) or Annual Maintenance (A.M.) Estimate:

- Annual Repair (A.R.) or Annual Maintenance (A.M.) is a detailed estimate prepared to keep or maintain the building or roads in proper working and safe condition.
- In case of buildings, this includes items such as white washing, painting of doors and windows, inside and outside plastering and minor repairs etc.
- The amount of such estimate should be within 1.5 to 2% of the original cost of the building.

4) Define contingencies?

Ans:

- The terms Contingencies indicates incidental expenses of miscellaneous character which is cannot be classified under any distinct item sub head.
- In estimation a certain amount in the form of contingencies of 3 to 5 % of estimated cost, is provided to allow the expenses for miscellaneous petty items.

5) Define work establishment charge?

Ans:

- The work establishment which is charged during the construction of a building or a project a certain number of work supervisors, chaukidars, mates munshies, etc., are required to be employed their salaries are paid from the amount of work charged establishment provided in the estimation. For work establishment a percentage of 1.5 % to 2% is included in the estimate.

6) Define schedule rates?

Ans:

- A schedule rate is a list of rates of various items of work. To facilitates the preparation of estimates, and also to serve as a guide in connection with contract agreements, a schedule of rates for all items of work is maintained in the engineering department in the form of a printed books known as schedule rate book.

7) Define administrative approval or sanction?

Ans: For any work or project required an approval or sanction by a competent authority of the department (PWD), with respect to the cost and work is necessary at the first instance.

Administrative approval denotes the formal acceptance by the department concerned of the proposal, and after the administrative approval is given the engineering department (PWD) take up the work and prepares detailed design. Plans and estimates and then executes the work.

8) Define technical sanction?

Ans: Technical sanction means the sanction of detailed estimate, design calculations, quantities of works, rates and cost of the work by the competent authority of the engineering department.

9) Define bill of quantities?

Ans: it is a statement of the various items of work giving the description, quantities and unit rates. It is prepared in tabular form similar to the abstract o estimated cost of the detailed estimate. But the rate columns are left blank (unfilled). When priced, the rates and amount are filled up and totaled.

10) Define plinth area?

Ans: plinth area is the built up covered area of a building which is measured at floor level of any stores. Plinth area is calculated by taking the external dimensions of the building at the floor level.

11) Define floor area?

Ans: Floor area of a building is the total are of floor in between walls and consists of floor of all rooms verandahs passages corridors staircase room, entrance hall, kitchen, stores, bath and latrine etc.