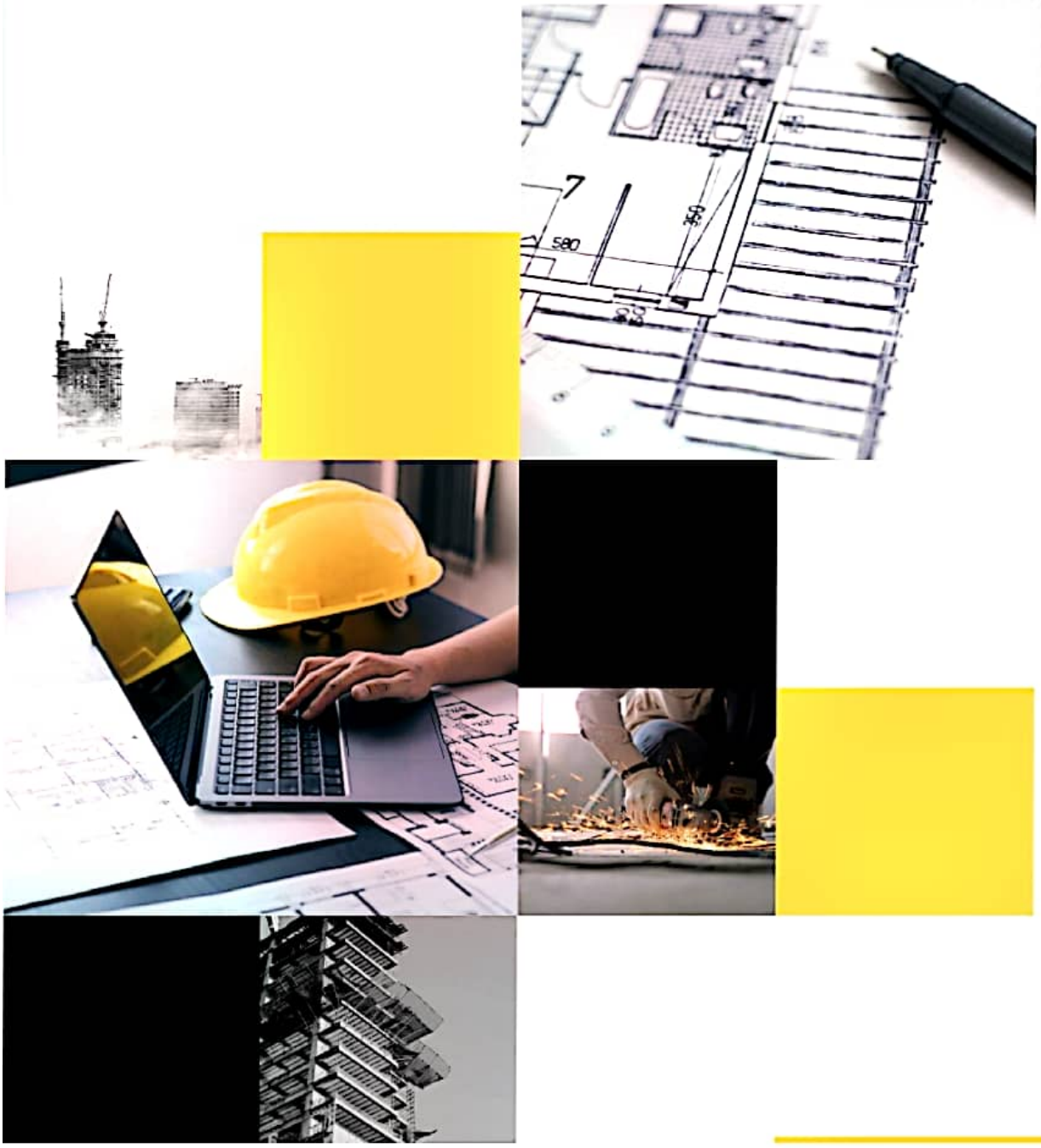


2ND EDITION

ESTIMATION COSTING & CONTRACTS

(CIVIL ENGINEERING)

CIVIL ENGINEERING FORUM | CHINMOY GHOSH

Index

Chapter 1 — Methods & Types of Estimates

Estimate:

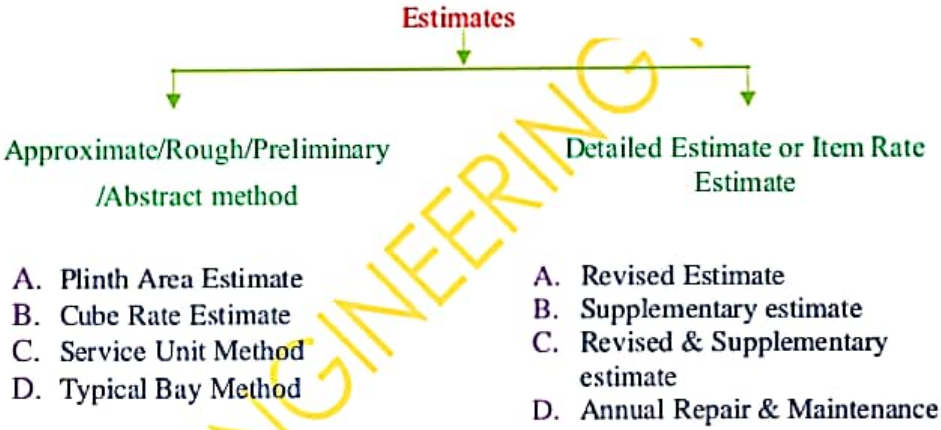
- Probable rough cost of any project before the start of work. [NMRC JE-17]
- The actual cost of a work is known as the completion of the work. [HR SSC-18]

Data for Estimate: [DMRC-18]

1. Drawing: Plan, Elevation, Cross section view.
2. Specification (General & Detailed): Description of work, give required information which not included in drawing. [RRB-19]
3. Rates: "3M Rule"- Manpower (25%), Material (25%), Machine (1-1.5%).

Types of Estimates:

Generally, its two types:



1. Approximate/Rough/Preliminary/Abstract method:

- Prepare for administrative approval.
- Purpose:
  1) Feasibility Study
  2) Availability of funds
  3) Decision for preparing detailed estimate
  4) For Insurance

A. Plinth Area Estimate:

- Least accurate among all approximate method.
- It is the build-up area (2-dimensional, Length x Breadth).
- Estimate prepared on the basis of the built-up covered area at the floor level of any storey of a building. [SSC-18]
- For multi storied building plinth area estimate is done separately for each story.
- Calculated by Total plinth area multiplied by rate per unit area. [SSC-19]

B. Cube Rate Estimate:

- Used for multi-storied building (3-dimensional, Length x Breadth x Height). [SSC-18]
- More accurate than plinth area estimate.

Factors to be considered in detailed estimate: Quantity, Availability, Transportation of materials etc.

A. Revised Estimate:
- When material deviation in large amount.
- When original sanctioned estimate > 5% more of whole project.
- When sanctioned estimate > Actual requirement.
- When expenditure of work > 10 % of administrative approval. [DMRC-18]

B. Supplementary estimate:
- Prepared when additional work (new concept, design change etc.) is required to supplement the original work.
- It is required to be sanctioned from engineer-in charge.

C. Revised & Supplementary estimate:
- When material deviation & change in design both are happened.

D. Annual Repair & Maintenance:
- To maintain the structure in a safe, proper & working condition ex: Road patch work, white washing etc.

Notes:
- Degree of Accuracy (Decreasing order)
  Detailed Estimate > Cube Rate Estimate > Plinth Area Estimate > Rough Estimate

Method of measurement: [NPCC-17]

1. Long wall & Short wall method
2. Centre line method
3. Crossing method

1. Long wall & Short wall method:

- Used in PWD method.
- Also called individual method, separate wall method, general method.
- Time consuming but Simple & accurate.
- Long wall measured out to out in longitudinal direction & short wall measured inner to inner in transverse direction.
- Length of long wall decrease as one move from earthwork to brickwork in super structure & length of short wall increases as one move from earthwork to brickwork in super structure. [SSC-18]
- Length of long wall= c/c length of long wall+ width of wall (For equal width of wall).
- Length of long wall= c/c length of long wall+ ½ breadth of wall on each side (For unequal width of wall) = c/c length of long wall+ ½ W_1 + ½ W_2 [MP-17]
- Length of Short wall= c/c length of short wall - width of wall (For equal width of wall). [SSC-18]
- Length of Short wall= c/c length of short wall - ½ breadth of wall on each side (For unequal width of wall).

Chapter 2 — Methods & Types of Estimates

Units of Measurement:

- Mass work/ volume & thick work: m^3. Ex: Concrete, Brick work, Stone work etc.
- Shallow & thin surface work: m^2 (1-dimension specified). Ex: Plastering, DPC etc.
- Long & thin work: Running meter (Band of specified work). Ex: Wire fencing, Cornice etc.
- Piece work/ Item work/Job work: Number. Ex: Electric work, door & window etc.

Types of Work	Measurement Unit	Description of Work
Earthwork excavation	m^3	✓ General Cutting, Filling & Excavation
	m^2	✓ Surface dressing up to 15 cm. ✓ Surface excavation up to 30 cm (w>1.5 m, plan area=10 m^2). ✓ Side drain along roads (w=1.5m, D=30 cm).
	m	✓ Excavation in trenches for pipes, cables up to 1.5 m.
RCC	m^3	✓ Sunshade, Slab, Lintels, Foundation, RCC Chajjasetc.
	m^2	✓ RCC wall panel. ✓ Lean concrete in roof terracing. ✓ Lining of canal. ✓ Floor concreting. ✓ Jaali/Jafri work. ✓ Formwork/Shuttering.
Damp Proofing	m^2	✓ DPC (thickness specified)
	m^3	✓ Foundation, Plinth, Super-structure, Arches, Reinforced brickwork etc. (when thickness of wall>10 cm)
Brickwork	m^2	✓ Partition/Half brick wall ✓ Brick Flat Soling ✓ Honeycomb brickwork ✓ Broken glass coping
	m	✓ Brick on edge ✓ String course, drip course, coping, cornice work.
Stone work	m^3	✓ Stone masonry (thickness> 10 cm)
	m^2	✓ Stone in roof slab, wall facing (thickness ≤ 10 cm). ✓ Dressing of stone. ✓ Stone sunshade, chajja, shelves etc.
Wood work	m^3	✓ Door & Window frame or chow khat, rafters, beamsetc. (thickness > 10 cm).

10. Paneled door	30 %	1.30
11. Collapsible door	-	0.75

Note: For 100 m^2 of roof surface, the area of A.C corrugated sheets required will be 115 m^2.

Earthwork

Brickwork

Brick flat soling

Steel work

Plastering

Painting work

DPC

Degree of accuracy in estimation:

- Wood work – 2 mm (length)- 0.001 m^3 (volume)
- Steel Work- 1 mm
- Glass Work- 0.5 cm (0.005 m)
- Reinforcement - 5 mm (0.005 m)
- Weight - 1 kg (0.001 ton)
- Length, Area, Volume - 0.01 m, 0.01 m^2, 0.01 m^3 respectively.
- Thickness of slab, sectional dimension of column, beam measured in 0.5 cm.

Opening/ Deduction rules: (As per IS: 1200)

1. **Masonry work:**
   - No deduction when area less than 0.1 m^2 or 1000 cm^2. [SSC-18]
   - No deduction when end of beam, post rafters, purlin up to 0.05 m^2 or 500 cm^2 or 77.5 in^2. [SSC-18]