

What is Cost Estimation in Construction?

Worksheet

Cost estimation predicts total project expenditure (labor, materials, equipment, overhead) early in planning; cost control tracks and manages actual spending against that estimate.

Questions

1. Cost estimation methods include...

- A) only guessing
- B) unit rates, parametric models, historical analogy, and detailed takeoff
- C) only material cost
- D) only labor cost

2. A budget of €10 million; actual cost after 50% complete is €5.5 million. This project is...

- A) under budget
- B) over budget by €0.5 million
- C) on budget
- D) can't be determined

3. Contingency in cost estimates...

- A) is not necessary
- B) covers unforeseen risks and small changes
- C) is the same as profit
- D) should never be used

4. During execution, cost control involves...

- A) only reporting final cost
- B) tracking actual vs. budgeted cost, managing changes and forecasting final cost
- C) never changing the budget
- D) ignoring overruns

5. A 10,000 m² office building: excavation unit rate €15/m³, expected volume 2,000 m³. Labor €50/m³ for 1,500 man-days, 8h/day at €50/h. Total excavation cost?

6. Budget estimate: €5,000,000. After 3 months, actual cost is €1,350,000 (27% of budget). Progress is 20% complete. Is the project over budget?

7. Concrete cost increased 15% due to market conditions. Original estimate €500,000. Impact on project budget of €4,000,000?

8. Define: What is cost estimation?

9. Define: When is cost estimation most accurate?

10. Define: What does contingency cover?

Answer Key

1. B) unit rates, parametric models, historical analogy, and detailed takeoff — Multiple methods are used: unit rates (cost/unit), parametric (cost/m²), analogy and detailed-line item estimates.
2. B) over budget by €0.5 million — At 50% complete, planned cost is €5 million; actual €5.5 million = €0.5M overrun.
3. B) covers unforeseen risks and small changes — Contingency (typically 5–15%) buffers for unknowns (weather, site conditions, supply delays) and minor changes.
4. B) tracking actual vs. budgeted cost, managing changes and forecasting final cost — Cost control compares actual to planned, identifies variances early and adjusts spending or scope to manage budget.
5. Material & equipment: $2,000 \text{ m}^3 \times €15/\text{m}^3 = €30,000$. Labor: $1,500 \text{ man-days} \times 8\text{h/day} \times €50/\text{h} = €600,000$. Total excavation: $€30,000 + €600,000 = €630,000$.
6. Earned value ($20\% \times €5,000,000$) = €1,000,000 (planned value for 20% complete). Actual cost €1,350,000 vs. earned value €1,000,000 = €350,000 overrun (variance). Forecast final cost: $€1,350,000 \div 0.20 = €6,750,000$ (overrun of €1,750,000).
7. Cost impact: $€500,000 \times 15\% = €75,000$ increase. New total budget: $€4,000,000 + €75,000 = €4,075,000$. This requires change order approval and budget adjustment.
8. Forecasting total project cost based on scope, design, schedule and market rates for labor, materials and equipment.
9. Detail design phase; early conceptual estimates have $\pm 30\text{--}50\%$ accuracy; detailed estimates $\pm 5\text{--}10\%$.
10. Unforeseen conditions (soil conditions, weather, supply delays) and small changes; typically 5–15% of base estimate.

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