CONCEPT

Project Cost Estimating: Estimate Classes, Unit Rates and Basis of Estimate

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Introduction:

Project cost estimating decides whether a capital project is approved, funded and bid at a realistic figure, yet many estimates reach sponsors with an unclear class, untraceable unit rates and a contingency nobody can explain. This Core Concept course builds the estimating discipline to classify an estimate by project definition, apply capacity-factored, parametric, analogous and bottom-up methods, price labour, plant and materials, add indirects, escalation and contingency, and document it all in a basis of estimate. Participants finish with a Basis of Estimate and Class-Rated Estimate Workbook for a capital project of their own.

Course Objectives:

- Classify a capital project estimate by project definition maturity and state its expected accuracy range using the AACE 18R-97 classification
- Prepare estimates with capacity-factored, parametric, analogous and bottom-up methods and choose the method that fits the available design deliverables
- Build unit rates from quantity take-off, labour productivity, crew composition, equipment rates and material quotations
- Add field and home-office indirects, owner costs, escalation and location adjustments to a direct cost estimate
- Quantify contingency with risk-based range estimating and review an estimate against benchmarks and historical returns
- Write and defend a basis of estimate that records scope basis, pricing basis, methods, assumptions, inclusions and exclusions

Target Audience:

- Estimating staff who prepare owner, feasibility and bid estimates for capital projects
- Quantity surveying staff responsible for measurement, take-off and unit rate pricing
- Cost engineering staff who set estimating standards, cost codes and historical cost databases
- Project controls staff who receive estimates and convert them into control budgets
- Engineering and design staff who supply scope deliverables and equipment lists to the estimating team
- Commercial and tendering staff who assemble contractor bid prices and qualifications

Course Outline:

Day 1: Estimate Purpose, Project Definition and Cost Elements

- Estimate End Uses: Screening, Feasibility, Funding Authorisation, Control and Bid
- Scope Definition Deliverables Checklist for Process, Building and Infrastructure Assets
- Owner Estimate Versus Contractor Bid Estimate: Pricing Perspective and Exclusions
- Direct, Indirect, Owner and Allowance Cost Elements in an Estimate Summary
- Estimating Plan: Team Roles, Data Sources, Timeline and Review Points

Day 2: Estimate Classification and Breakdown Structures

- AACE 18R-97 Five Estimate Classes and Project Definition Maturity Levels
- Expected Accuracy Range Bands by Class and the Factors That Widen Them
- Work Breakdown Structure Coding for Estimate Roll-Up
- Cost Breakdown Structure and Code of Accounts Mapping by Discipline
- Estimate Class Selection Matrix Against Available Design Deliverables

Day 3: Conceptual and Detailed Estimating Methods

- Capacity-Factored Estimates and Cost-Capacity Exponent Scaling
- Equipment-Factored Estimates Using Installation Factor Sets
- Analogous Estimating from Completed Project Returns with Size, Location and Time Adjustment
- Parametric Cost Models Built by Regression on Historical Unit Costs
- Bottom-Up Detailed Estimate: Quantity, Unit Rate and Extension Logic

Day 4: Quantity Take-Off, Unit Rates, Labour, Plant and Materials

- Quantity Take-Off from Drawings and 3D Models Using Standard Measurement Rules
- Unit Rate Build-Up from Labour, Plant, Material and Subcontract Components
- Labour Productivity Norms, Man-Hour Units and Productivity Adjustment Factors
- Crew Build-Up Sheets and Composite Crew Rate Calculation
- Equipment Ownership and Operating Rates and Material Quotation Bid Tabulation

Day 5: Week-One Case: Estimating a Treatment Plant Expansion

- Case Brief: Water Treatment Plant Expansion Scope Package and Design Status
- Capacity-Factored Screening Figure for the Case Plant
- Civil and Structural Take-Off and Unit Rate Extension for the Case
- Mechanical Package Pricing from Vendor Quotations and Freight Terms
- Case Estimate Summary Sheet and Peer Arithmetic Check

Day 6: Indirect Costs, Escalation and Location Pricing

- Field Indirects: Site Establishment, Temporary Facilities, Supervision and Utilities
- Home-Office Engineering, Procurement Services and Owner Cost Build-Up
- Escalation from Published Cost Indices Applied to the Spend Profile Midpoint
- Location Factors, Currency Conversion and Imported Content Pricing
- Freight, Duties, Capital Spares, Start-Up and Commissioning Allowances

Day 7: Contingency, Range Estimating and Estimate Quality

- Contingency, Allowances and Management Reserve: Definitions and Boundaries
- Percentage and Expert-Judgement Contingency and Its Limits
- Range Estimating on Critical Cost Items with Low, Most Likely and High Values
- Concept-Level Monte Carlo Simulation and Reading Confidence Level Outputs
- Estimate Quality Review Checklist and Red-Flag Tests

Day 8: Basis of Estimate Documentation and Stakeholder Communication

- Basis of Estimate Structure: Scope Basis, Pricing Basis, Methods, Assumptions, Inclusions and Exclusions
- Assumptions, Qualifications and Exclusions Register
- Reconciliation Between Successive Estimate Classes and Explanation of Movement
- Presenting Estimate Ranges to Sponsors, Investment Committees and Lenders
- Estimate Handover Package to Project Controls and Procurement Teams

Day 9: Benchmarking, Historical Data and Estimating Improvement

- Benchmark Metrics: Cost per Unit Capacity, Cost per Square Metre and Ratio Checks
- Historical Cost Database Design and Normalisation of Completed Projects
- Estimate Accuracy Tracking: Estimated Versus Final Cost by Class
- Independent Estimate Review and Validation Panel Procedure
- Estimating Function Improvement Plan and Lessons Learned Capture

Day 10: Capstone: Building and Defending a Basis of Estimate

- Capstone Scope Selection: Own Capital Project and Target Estimate Class
- Class-Rated Estimate Workbook Completion with Indirects and Escalation
- Contingency Range Output and Confidence Level Recommendation
- Basis of Estimate Defence Before a Review Panel
- Panel Challenge Log and Final Estimate Revision

Skills You Will Gain:

- Estimate Classification
- Quantity Take-Off
- Unit Rate Analysis
- Crew and Productivity Analysis
- Conceptual Cost Modelling
- Escalation and Location Adjustment
- Range Estimating
- Estimate Benchmarking

Why Attend This Course:

- Return with a Basis of Estimate and Class-Rated Estimate Workbook for a capital project of your own, already tested by a review panel
- Explain to sponsors which estimate class a figure represents and why its accuracy range is as wide as it is
- Trace every unit rate back to productivity, crew, plant and material inputs so reviewers can check it
- Compare estimating practice with peers from process, building, water and infrastructure projects

Conclusion:

A reliable estimate is traceable: its class matches the project definition, its unit rates rest on productivity and pricing evidence, and its contingency reflects measured uncertainty. Week one covers classification, breakdown structures, estimating methods and pricing, closing with a guided plant case. Week two adds indirects, escalation, contingency and range estimating, basis of estimate documentation, benchmarking and review. The final day produces a Basis of Estimate and Class-Rated Estimate Workbook that participants defend before a panel and take back to their project.