

## **COST ESTIMATING & COST CONTROL**

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### **PART ONE: FUNDAMENTALS OF COST ESTIMATING**

#### **1. Purpose and Stages of Estimating**

- Introduction to project cost estimating
- Cost estimating fundamentals
- Developing Ground Rules and Assumptions
- Estimating at various project stages
- Types of estimating techniques - Order of Magnitude, and other cost estimating techniques
- The retrieval and use of historical cost data
- Estimate summaries

#### **2. Cost Estimating Principles**

- Cost Estimate Considerations
- Cost Estimating Principles
- Direct vs. Indirect Costs
- Variable vs. Fixed Costs
- Purpose of an Estimate
- Project Cost Estimating and Project Management Body of Knowledge

#### **3. Project Cost Estimating Cycle**

- The Cost Estimating Cycle
- Project Development Stage
- True Cost
- Variables
- Work Breakdown Structure (WBS)
- Project Schedule

#### **4. Initial Cost Estimates**

- Importance of early estimates?
- Risk in initial estimates
- Initial estimates for different contract strategies
- Estimating techniques for initial estimates
- Suitability of estimating techniques for project stages
- Practical aspects of initial estimating
- Lessons Learned of previous projects

#### **5. Cost Estimating at the Design Stage**

- Feasibility cost estimating
- Proposal estimating
- Cost estimating for management's approval
- Conceptual design and costing
- Detailed design and costing

#### **6. Conceptual (Preliminary) Cost Estimates**

- What is Preliminary Cost Estimate?
- Purpose of Preliminary Cost Estimate
- Preliminary Cost Estimating Techniques
- Cost-Capacity Relationship
- Square-Foot (SQ M.) Cost Estimating
- Cubic-Foot of Volume Cost Estimating
- Range Estimating (Factored Cost Estimating)

### **PART TWO: DETAILED COST ESTIMATING**

#### **7. Cost Estimating for Construction**

- Tender and Construction stage final costs
- Competitive environment
- Importance of cost estimating at this stage
- Tendering process, and decision to tender
- Planning the production of the cost estimate
- The Estimate Skeleton: The Work Breakdown Structure

- Integration of Time and Cost
- Collecting the ingredients of the estimate
- Labor, Material, Equipment, Sub-contracts
- Probability approach for cost estimating
- Preparing the base cost estimate
- Unit rate estimating, examples
- Operational estimating, examples
- Develop Overhead and Administration cost estimates
- Allowances and Contingency
- Dealing and Applying Escalation and Inflation (Cost Growth) Factors
- Analyzing, Adjusting, and Supporting the Cost Estimate

## **8. Parametric Cost Estimating** **“Elemental Analysis Cost Estimate”**

- What is Parametric Cost Estimate? An Overview
- Origin and Purpose of Parametric Cost Estimate
- Design Parameters Available for Parametric Cost Estimate
- Parametric Cost Input
- Difficulties and Accuracy Level with Parametric Cost Estimates
- Applicability of the Parametric method

## **9. Cost Indexes (Indices)**

- What is a Cost Index?
- Purpose of Cost Indices and Their Use in Cost Estimates
- Input Cost Indices vs. Output Cost Indices
- ENR Construction and Building Cost Index
- Development of a Cost Index
- Uses and Limitations of Cost Indices

## **10. Unit Price Estimates**

- Purpose of Unit Price Estimates
- Labor, Material and Equipment Cost Estimates
- Unit Price Proposal
- Pay Items vs. Cost Items

- Allocation of Costs into Pay Items
- Unbalancing Opportunity with Unit Price Estimates!

### **11. Human Factors in Cost Estimating**

- Skills and characteristics of the estimator
- Influence of experience, and key questions to ask
- Contingency margins
- Risk analysis
- Factors affecting cost estimate accuracy
- Pareto's law (80/20 rule)
- Interpretation of cost data, and documentation of cost data
- Obtaining good cost quotes for suppliers and vendors

### **12. Contract Considerations**

- Basic contract types
- Fixed Price arrangements
- Cost reimbursement arrangements (Cost-Plus)
- Unit-Price Contracts
- Contract clauses
- Negotiation, Award, and Audit
- Ethics

### **13. Project Cost Control**

- Establish Information Reporting Requirements
- Cost Baseline
- Analyzing the Cost Performance Information Reports
- Earned Value Concept (Budgeted Cost of Work Performed)
- Progress vs. Planned vs. Actual Costs Analysis
- Cost Variance Analysis (CV)
- Establish Variance Thresholds for Mandatory Reporting
- Determine Actual Cost Status
- Cost Performance Key Indicators (CPI)
- Forecasting Cost to Complete Projects
- Analyze Short and Long Impact on Project Cost

- Identify Possible Corrective Action(s) to be Taken
- Cost Change Control System
- Forecasting estimate at completion (EAC)
- Lessons Learned for costing future projects

#### **14. Project Cost Reporting and Reports**

- Structured Standard Reports
- Reporting Level, Frequency and Distribution
- Resource Usage Reports (Histograms)
- Analysis of Cost “S” Curves
- Budget Status Reports (BCWS)
- Cost Status Reports (ACWP)
- Job Cost Control Reports
- Project Cost *look ahead* Reports