The Estimating Process Conceptual Estimates

Week 2

Construction Estimation, Planning and Control

The Process (Chapter 3)

- Preliminary workload assessment
- Workload breakdown
- Preliminary work-plan
- Gather expertise around: material suppliers, vendors, contractors etc.
- Laying down expectations
- Establishment of estimate work plan, staffing requirements
- Iterate

Checks

- Reasonableness
- Compare with similar projects
- Compare with industry standard estimates
  - $/sq-ft, $/pupils, $/capacity

Risk Analysis

- Why do it?
  - To assign contingency
- What are the methods?
  - Expected risk (Max Risk x probability)
  - % Of base price
  - Simulate different possibilities: explore "what-if" scenarios: CrystalBall software
- Sensitivity Analysis

Conceptual Estimates

- Based on primary function
  - Hospitals: cost/bed
  - Schools: cost/sq-ft
- Based on area/volume
- Modified for:
  - Time
  - Location
  - Capacity
  - Size

Broad Scope Estimates

Unit Cost (UC) forecast = (A + 4B + C) / 6

A = Minimum unit cost of previous projects
B = Average unit cost of previous projects
C = Maximum unit cost of previous projects

Cost Index

- Used to update historical cost data
- Take into account inflation (i)
- Base year Jan 1, 1913
- Page 437 of RS Means (See announcements for latest ENR construction cost index)

Adjustment: Time

- $I(2005 + n) = I(2005)(1+i)^n$
- I(2005) = 7518.28 i = 3.0% (0.03)

Cost(Year B) =
Cost(Year A)[(Index B)/(Index A)]

Adjustment: Location

- To adjust for local differences
- RS Means page 458
- 49931: 92.2

Cost(City B) =
Cost(City A)[I(City B)/I(City A)]

Adjustment: Process Unit Capacity

Cost(Process Unit B)= Cost(Process Unit A)
x $[C(\text{Project B})/C(\text{Project A})]^a$

$C()$ = Process unit capacity

a = Slope of cost capacity curve

Relationship of plant cost vs unit production assumed linear over narrow capacity ranges

Adjustment: Unit cost for size

- Unit cost goes down for higher outputs
- Use historical data to build linear relationship
  - $Y = mX + c$
  - Y: Cost per unit X: Number of units
  - For given (x_1,y_1) and (x_2,y_2) calculate m and c