Warm Mix Asphalt Site Visit

- Allows Mixing, Transporting and Laying of Asphalt at lower temperatures (~ 100 F)
  - Impacts on construction site?
- Reduced fuel (and energy) consumption
- Reduced emissions
- Easier lay-down and compaction

WMA: Example of Integration

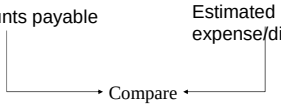
- Comparable Durability & Long Term Performance
- Reduced Environmental Impacts
- Economic Benefits
- Worker safety

Cost Control

- Controlling on-going expense
- Information required:
  - % Completion
  - Estimate of cost of material stored on-site
  - Accrued expense (so far, independent of payment)
  - Estimated cost
- Check Accrued Expenses so far vs. Estimated Expense

Cost Control

- Accrued expense/div
  - +Cash expenditures
  - - Inventory valuation
  - + Accounts payable
- Estimated expense/ As-planned expense:
  - % completion x Estimated expense/div.



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

- $I(2006 + n) = I(2006)(1+i)^n$
- I(2006) = 7763.15 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)]

http://www.rsmeans.com/calculator/index.asp

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*

Adjustment: Process Unit Capacity
(Chapter 4)

Cost(Process Unit B)= Cost(Process Unit A)
x [*C*(Project B)/*C*(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

The Denver School Board is working on its budget for the year 2008. One of the capital expenditures projected for the year is the construction of a new High School to satisfy increased demand. The plan calls for a facility with a capacity of 800 students to be built in a piece of land already owned by the City. Estimate the cost of the new building and recommend to the School Board the amount they should budget for the project.

Basic Unit Cost: Given the average cost per pupil in 2005 in the US for a High School was $16,872. I(2005) = 7518.28

Inflation = 3%

Design fees for school buildings between $10 million and $50 million = 6%

Using the information provided in Figure estimate the combined design-construction cost of a High School with a total area of 170,000 SF, face brick with concrete block back-up in the exterior walls, a steel framing system, 10' story height, four elevators of 2,500 pounds capacity each, and two 40' height aluminum flagpoles. Calculate how much more would it cost to include a 20,000 SF basement as a percentage of the original design-construction costs.