COST ESTIMATING PROCEDURES, TOOLS AND CONSIDERATIONS

2015 Transportation Improvement Conference
Wisconsin Dells, WI

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Why Are We Here?

• Project estimates have been showing a trend of under estimation with WisDOT bids
• New WisDOT performance measurements are focusing on the issue.
• On behalf of WCPA members thank you for asking me
• Qualifier, my comments will be slanted towards concrete pavement
• Only thing I have done for 20 years
Goal

- My goal is to identify
  - Traditional cost estimation issues
  - Non-traditional cost estimation issues
Project Control / Cost Curve

- Ability to Control Change
- Cost of Change

Project Timeline, by Phase

WisDOT/ACEC-WI Transportation Improvement Conference - March 3, 2015
Topics to Discuss

• Competition
• Materials
• Project Location
• Project Size
• Constructability
• Risk
COMPETITION
COMPETITION

• Project type –
  – Rural or Urban
  – Reconstruct or Rehab

• Project size – small and mega
  – Bonding
  – Equipment owned by contractor

• Project complexity
  – Personality of contractor
  – Equipment capabilities of contractor
  – Standard construction and specs
  – Multiple stages

• Time of year project is let

WisDOT/ACEC-WI Transportation Improvement Conference - March 3, 2015
Goal for WisDOT Monthly Lets

- July, August and September are not months contractors want to bid
- Concentrating on work at hand of construction
- Time in bidding is an issue
Goal for WisDOT Monthly Lets

- Months contractors want to bid
- Concentrating on bidding of work for the construction season
- Hungry for work
- Most time to understand plans and refine bids
MATERIALS
MATERIALS

• Project location and material availability
  – Research during design
  – Pavement Design
  – MRS
MATERIALS

• Standard material requirements
  – Dowel bar example
  – Curing compound example

• Material Costs
Material Costs

• WisDOT Annual Quantity Estimates

Estimated Concrete Quantities For FY 14

- '08: 2.0
- '09: 2.1, 1.2
- '10: 2.8, 0.6
- '11: 3.4
- '12: 3.4
- '13: 2.5, 2.4
- 14: 2.4

Millions Of Square Yards
Material Costs

• WisDOT Annual Quantity Estimates
  – Annual production targets for an industry
  – Accuracy is essential
  – Control of volatility in prices over the year
  – 2014-2015 concern on Portland Cement prices as an example
Material Costs

- WisDOT Annual Quantity Estimates
- Historical material costs
- Understanding cost trends
Materials Costs

![Graph showing Producer Price Indices - Competitive Building Materials](image)

- **Asphalt**
- **Steel**
- **Concrete**
- **Lumber**

Source: Bureau of Labor Statistics
PROJECT LOCATION

• Local materials – aggregates are the biggest issue
• Regional shipping and transportation issues
• Adjacent projects
  – Contractor project
  – Material supplier
• Delivery of Materials
PROJECT SIZE

• Economies of scale
  – Mobilization, equipment, labor, etc. fixed costs

• Production rates
  – Ready mix vs. central mix concrete

• Hand work vs. machine work
  – Handform vs. slipform (pavement and barrier)
CONSTRUCTABILITY
CONSTRUCTABILITY

• Keep in mind that the price you get on a bid for any item is a blended price considering many factors
CONSTRUCTABILITY

• Optimize the design
  – Concrete Paving Examples
    • Uniform lane widths
    • Length of paving runs
    • Handwork vs. slipform
      – 2 to 2.5 times the cost for the reduced production and increased labor
CONSTRUCTABILITY

• Optimize the design
• Reduce staging
  – Long production runs vs. short bursts
• Number of mobilizations
  – Equipment, material and labor all part of this.
• Project access
• Work restrictions – contract requirements that limit production
NIGHT WORK

• Extra safety costs
• Extra equipment costs
• Experience shows production is less
• Lane restrictions

• ALL ISSUES OF NIGHT WORK POINT TO HIGHER COSTS
• Night time concrete repair example
**RISK**

- Clear and accurate plans
- Liquidated damages, lane closure penalties, interim completion dates, etc.
- Completion date vs. working day contract
- Single year vs. multi-year
- No excuse clauses
Clear and Accurate Plans

• We all strive for it
• Good plans equals good bids
• Use of standard details and specs need to have priority
• Approach your plan with the expectation that the contractor is not an engineer/designer (barrier wall example)
• More details, miscellaneous quantity sheets, etc. is better
• Incidental and lump sum must be avoided
LIQUIDATED DAMAGES, LANE CLOSURE PENALTIES, INTERIM COMPLETION DATES, ETC.

• Every one of these mean risk and the potential for penalty to the contractor.
• Contractors love every day and ordinary construction.
• Seriously evaluate every project in the need for the use of these tools.
• Common consensus of the contracting industry:
  – These tools are over used
  – Unnecessary on many projects
  – Most reasons for using them are covered in the standard specifications
Calendar Day vs Working Day

• Again, seriously evaluate the merits of one or another on your project.
• Not every project is appropriate for calendar day.
• Don’t let this provision restrict the number of bids you get.
Multi-Year Contract

- Did you consider:
  - Inflation
  - Material cost volatility
  - Labor cost increases
  - Fuel costs
  - Equipment costs
  - Weather risks

- Were estimates revised to account for the work done over multiple years?
Remember this graph....
Fuel Costs

Crude Oil Price
104.93 USD/bbl
4 Aug '14


0  20  40  60  80  100  120  140  160  180

Crude Oil Price (USD/bbl)

InfoMine.com
Multi-Year Contract

• Did you consider:
• Were estimates revised to account for the work done over multiple years?
• Steel quote example
  – Historical
  – Recent trend
  – Multi-year project quote
  – Steel producer, fabricator and contractor
No Excuse Clauses

• Things happen that are out of the contractors control
  – WEATHER
  – Other natural disasters/accidents
  – Labor disputes and shortage
  – Material shortage
  – Transportation/Trucking issues

• **RISK**
Final Thoughts....

• We are in the age of information.

• We can easily determine bid item history
• Adjust for current project and conditions
• May we never use average unit bid prices again
Discussion & Questions

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