THE IDEAL BRIDGE

A Contractor’s Perspective on Project Costs

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Key Points for Discussion

- Design Considerations
- Constructability
- Construction Methods / Materials
- Factors of Cost
- Drawing Presentation
Design Considerations

**Geometry** – Straight not curved, Flat not round, Minimize super elevation, Skewed decks

**Standardize** – Element dimensions, Materials, Market availability

**Structure Element Specifics** –
- Bridge bearings (simple vs. $ exotic)
- Stay-in-place deck pans (matching pitch)
- Diaphragms – Bolted / Welded connections
- Deck Overlays – Single Lift Deck Construction, Surface Prep, Specialty Equipment
Design Considerations

Structure Element Specifics -

- Foundations - Shallow Foundations = Spread Footings
- Deep Foundations = Pile Arrangements

Minimize Retooling of Equipment

Driving Criteria “Min Tip”, “Est Tip”
“Ultimate Capacity” “Driving Capacity”

“Context Sensitive Design”- Architectural Concrete
Formlined Concrete

COSTS INCREASE

“Scope Creep”- Outside influences will add “ornaments”
Constructability

Site Access – Heavy Equipment
Maneuverability

Crane Options – Pick Weights
Constructability

**Repetitiveness** –
- Form Re-use
- Maximize Production
- Common Sized Elements
- New Technologies
  - Gantry Systems
  - Jacking/PT Equipment
  - Slipforming
Constructability

Environmental Impacts
- Permit Restrictions (Project Calendar)
- Local Climate Impacts
- Work Hour Restrictions (Night work)

“Outsider” Influences
- Press Coverage
- Video Documentation
- Historical Significance
Constructability

Equipment Availability
- Increased Competition
- Regional Considerations
- Specialty Fabrication
- Lead Times
Constructability

**Traffic Control-** EXPOSURE!!
- Protection of Traveling Public & Construction Personnel
- Close and Detour around Project
- Simplify Staged Construction
- Minimize Traffic Pattern Changes
- Weather / Seasonal Impacts – (Project Calendar)

**Construction Partnership –** “We’re in this together”
- New Partnership Philosophy between Engineers & Contractors
- Empowerment – Give those the power to make a decision
- Field Resolutions – Less costly than Claims & Force Accounts
- Same Goal – Betterment for the Public Good
- Public Perception – Over Budget & Behind Schedule
- Construction is an extension of Design
Construction
Methods & Materials

Means & Methods – Contractors Responsibility
➢ Minimize detailed specification processes
➢ Balance for Specialty Construction

Material Specifications – Close consideration
➢ Proprietary or Patented Items - reduces competition
➢ Industry Trends – Regional
➢ Recycled Materials – Onsite and Offsite materials
   Embankment materials
   Concrete
   Asphalt
➢ Price Indices
Factors of Cost

All of the Above –

More Specifically-
- Driving Material Markets – (PVC/Fiberglass)
- Escalation trends (Fuel, Steel, Cement)
- Guaranteed Pricing (“endangered species”)
- Labor Components such as:
  - Insurance (heath, liability, builders risk, etc.)
  - Wage Compliance (geographic location)
  - Union vs. Nonunion
  - Work Rules
Factors of Cost

- Unnecessary Contractor Contingencies

- Too much “Risk Shift” –
  Higher perception of risk leads to higher costs

- Established Project Schedule
  Unrealistically short = Liquidated Damage Inclusion & Overtime (effects prequalification)
  Too Long = Crystal Ball (tough to estimate escalations)

- “E” Factor - Engineer Factor (Reputation- Good, bad?)
Factors of Cost

*Possible Alternatives* –
- Include options for Alternates (Steel vs. Concrete)
- Provide Early Completion Incentives
- Establish “Allowances” in Contract for any uncertainties
- Continuous Projects –
  - Multiple vs. Single Stage Construction
- “If & Where Directed” Items – Pros & Cons
Factors of Cost

Philosophical Approach

- National Campaign to sway public perception (ARTBA)
- Teach & Promote Partnership between Engineers & Contractors (we are not “money hungry dumb contractors”)
- Engineer’s Reputation for Fairness – A tough but fair and consistent attitude will prevail over unreasonableness
- “Fair & Equitable Treatment” – Protection for the Contractor
- Engineers Estimates – can affect public opinion
Drawing Presentation

Clarity – No Imagination & No Guess Work (adds cost)

Details – More is better
Detail & Section numbering should be straightforward

Organized – Drawings are packaged properly with easy cross reference

Electronic Files – Make available for project use Construction Layout Shopdrawing Submissions
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