Strategies For Budgeting, Estimating and Managing Projects

Symposium on Capital Project Cost Estimation
Montgomery County Government

Michael D. Dell’Isola, PE, CVS, FRICS
Senior Vice President
Faithful + Gould
Maitland, FL 32751
Today’s Presentation

- Owner demands and concerns
- Cost estimating basics
  - Alignment
  - Building economics
  - What drives facility cost
- Key suggestions
Owner Demands and Concerns

• Demands
  – Complete their project to full scope and quality
  – Be on time and on budget
  – Involve everyone – exclude no one
  – Build something to be proud of
  – Avoid embarrassment

• Concerns
  – Users always want more than the owner can afford
  – Ability of designers to manage costs
  – Ability of PM’s and CM’s to manage users and designers
  – How to deal with “at risk” entities
  – Unknowns in the marketplace
  – Ability of owner’s staff to manage the overall process
Projects need to start right to finish right
Cost management is ALIGNMENT…

<table>
<thead>
<tr>
<th>SCOPE</th>
<th>EXPECTATIONS</th>
<th>BUDGET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurable and quantifiable aspects of the facility</td>
<td>Quality and performance expectations</td>
<td>The cost of the facility</td>
</tr>
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…and maintaining ALIGNMENT over time
Building Economics

- Types of cost
- Breakdown of construction costs
- Construction spending
- Competition and pricing
### Building Economics – Cost Components

#### Site Costs
- Land
  - Land cost
  - Commission & Fees
  - Title insurance
  - Transfer taxes
  - Surveys
  - Demolition
  - Sitework

#### Hard Costs
- Building
  - Foundations
  - Structure
  - Enclosure
  - Interior Finishes
  - Conveying
  - HVAC & plumbing
  - Electrical

- Interiors
  - Tenant work
  - Artwork
  - Furniture, Fixtures & Equipment
  - Telephone & Data Communications System

#### Soft Costs
- Development Costs
  - Design fees
  - Management fees
  - Legal fees
  - Taxes & levies
  - Insurance
  - Owner’s administration
  - Leasing commissions
  - Interim finance
  - Moving costs

### TOTAL CAPITAL COSTS
Breakdown of Construction Costs

- Total Hard Costs
  - Prime Contractor/CM Mark-up
  - Subcontractor Mark-up

- General Conditions
- General Conditions

- Materials
  - Purchase Cost
  - Taxes
  - Shipping & Handling

- Installation
  - Labor
    - Premiums
    - Fringes
    - Taxes/Insurance
    - Base Wages

- Equipment
  - Operations Cost
  - Equipment Rental
Construction Spending
January 1993 to June 2008

- Overall Construction
- Residential
- Non-Residential

Terrorist Attack
Housing Downturn
Effect of Competition on Prices

Source: Area Cost Factor Study, U.S. Army Corps of Engineers
What drives facility cost

- Scope
- Form, massing, volume & efficiency
- Quality and performance of materials and systems
- Geographical and Site
- Delivery method
- Phasing, scheduling and work restrictions
- Contractual and administrative
- Market factors and competition
- Unknowns & risk
Dealing with “Scope Creep”

- **Axiom -** *Unless restrained, scope will grow!*
  - *Why?*
  - Natural process
  - Human nature
  - Difficult to fit a program into a form
  - Insufficient control

- A study showed a major owner experienced 11.5% “scope creep” from inception to construction
Quality, Performance & Cost

- MAX
- MIN
- HIGH
- COST
- LOW
- QUALITY
- INITIAL COSTS
- FUTURE COSTS
- TOTAL LIFE CYCLE COST
- QUALITY LIMITS
- VC Tile Zone
- Bankrupt Zone
Effects of Plan Shape

Floor Area = 2,100sf

Adding the “notch” increases perimeter, wall area, and wall cost by 10%
## Impact of Building Efficiency

<table>
<thead>
<tr>
<th></th>
<th>Net Rentable Floor Area</th>
<th>Net Rentable Floor Area Ratio</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Building A</td>
<td>120,000 sf</td>
<td>80%</td>
<td>150,000 sf</td>
</tr>
<tr>
<td>Office Building B</td>
<td>120,000 sf</td>
<td>85%</td>
<td>142,000 sf</td>
</tr>
</tbody>
</table>
Geographical and Site

• Locality
  – Remoteness
  – Availability of labor, materials and constructors

• Site itself
  – Acquisition cost
  – Development costs
  – Direct impact on facility

• Market
Delivery Methods

• Design-Bid-Build
• Design-Build
• Construction Management
  – CM @ Risk
  – CM cost of the work
  – Owner as CM
• Job order contracting
Phasing, scheduling and work restrictions

- Overall project schedule
- Construction schedule
- Specific construction milestones
- Access/egress limitations
- Security
- Labor practices
- General requirements
- Any limitations on how the work is done (not the specific product)
Contractual and administrative

• Contracting approach
  – Hard bid
  – Prequalification – hard bid
  – Source selection (best value)
  – Other negotiation techniques

• Administrative
  – Bonding and insurance
  – Work rules
  – Reporting requirements
Factors Affecting Bidding

- Risk premium
- Purchasing aggressiveness
- Indirect costs
- Technological/Information advantages
- Opportunity cost
- Profit

*Each category can affect 5-10% - Combined over 30%*
Current marketplace

- Overall, construction is turning down, so will the market moderate?
  - Housing construction is down – over 15%
  - But, non-housing is up – over 15%
- Markets do not overlap a great deal
  - Labor, contractors, subcontractors tend to be separate
  - Materials do overlap
- **Predictions**
  - *Competition in commercial, industrial, institutional and public will remain tight and prices will not retreat*
  - *Housing downturn may affect pricing in hospitality market and may moderate educational (K-12) market*
  - *Past annual escalation of upwards of 15% will moderate downward – perhaps to general inflation + 5%*
Unknowns & risk

- Cost
- Schedule
- Management
- Perception
"It's worth a $100,000"

Are they the same?

$25,000  $75,000  $100,000  $125,000  $175,000
Risks in the Cost and Schedule

- Potential Low
- Expected Target
- Potential High

Cost Overrun
Schedule Overrun
Key suggestions
It All Starts with a Good Budget

• A Good Budget Should:
  – Reflect scope
  – Reflect quality/performance expectations
  – Reflect owners value objectives
  – Be achievable, acceptable and defensible
  – Contain adequate reserves
  – Be based on sound techniques and data
  – The result should be a “cost model” communicated to the designer as a basis of design

• Avoid
  – Socially acceptable budgets
  – Playing it safe
How best can a budget be projected into the future?

• **Key steps**
  – Be realistic about inflation/escalation in materials and labor
  – Be conservative projecting the market and competition
  – Include sensible risk and risk analysis in drivers in the budget

• **Impacts?**
  – Escalation will likely exceed general inflation by 2-5%
  – Competition – Three to five bidders will be 5-10% less costly than one/two
  – Other risks over key drivers could affect cost by 5% or more
When in the “best” time to “fix” a budget for appropriation?

• Options
  – Early - based on pre-conceptual design information
  – Later – based on schematic level design
  – Late – based on a GMP or other guaranteed price

• Advantages/disadvantages
  – The later in the process - more accurate the budget
  – The later in the process - higher the chance of “design breakage” through cancellation/postponement
  – Overall design/construction time likely benefitted by early budget fixing because of continuity
  – Some agencies/organizations have benefited from specialized project budgeting approaches
  – How much risk is the owner willing to take?
Aggressively manage the delivery process

• Monitor scope at each phase
  – Require scope submission and reconciliation
  – Require scope changes to undergo a rigorous review
  – “Expensive” spaces will tend to grow – “inexpensive” spaces will tend to shrink

• Communicate that estimates are important
  – Through contract terms
  – Require proper development
  – Do independent estimates
  – Force comprehensive reconciliations

• Use value engineering wisely
  – Start early
  – Participate
  – Follow through
Use effective formats

- Building Elements (UNIFORMAT)
- Plan & Program Areas
- Trades & Crafts (MasterFormat)
- WBS (Combines all)
- Activities & Work Packages
Effective Sources for estimating costs

• Choices
  – Historic project information
  – Building “from the ground up” – detailed estimating
  – Assemblies
  – Functional area method

• Recommendations
  – Budgeting and very early estimates – combine historical and functional area approach
  – Schematic – Assemblies with some details
  – DD and CD estimates – build from the ground up
  – *Spend some time and to gather your own historical costs*
How to promote competition

- Remember – *subcontractors are dominating the current market*
- Owner can control/enhance competition – take care with:
  - Contracts & provisions
  - Bonding & insurance requirements
  - General requirements
  - Schedule, access, security etc.
  - Payment history
  - Focus on goals not fixed targets
- Advertise intelligently
  - Appropriate to size & Complexity
  - Care with timing
  - *Assure funding is real*
- Design & specify wisely
  - Avoid scarce materials, complex systems & exceptional workmanship
  - Avoid proprietary choices
  - *Good quality documents*
What can be done if projects bid over budget?

• Examine bids in as much detail as possible
  – Number of primes is significant
  – But – number of subs per trade may be more significant
  – Talk with second bidder if rules allow

• If re-bidding
  – Review owner General Requirements carefully
  – Allow reasonable time for re-bidding
  – Be careful with complicated bid forms
  – Monitor other projects that are bidding to avoid conflicts
  – Examine specifications and details that can be easily modified
  – Negotiation (if allowed) may be superior to re-bidding
  – Adding more time to market may not improve price
  – Remember – bidders don’t like re-bidding – make it as easy as possible
Wrap up