CM/GC Properly Implemented Equals INNOVATION ON STEROIDS

Presenter: Gregg Hostetler
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CM/GC Projects
CM/GC Legislation

CM/GC 2007
- CM/GC Projects
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Common Contracting Methods

Notes
- CM/GC, AKA Construction Manager at Risk (CMAR)
- Progressive D-B (similar to CM/GC, but one contract)

CM/GC Benefits
1. **Innovation**
2. Reduction of Risk
3. Aggressive Delivery
4. Cost Control
5. Team Selection
6. Constructability
7. Streamlined Plans
8. Quality
9. Early Work Packages
10. Flexibility in Changing Project Scope
“We can’t solve problems by using the same kind of thinking we used when we created them.”
Albert Einstein

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Risk Comparison

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**Timeline Comparison**

Traditional Design Bid Build

<table>
<thead>
<tr>
<th>Contract Method</th>
<th>Mean Cost ($)</th>
<th>Mean Project Duration (Days)</th>
<th>Mean Agency Design Duration (Days)</th>
<th>Mean Construction Duration (Days)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-B-B (n=34)</td>
<td>$21,188,585</td>
<td>2,130</td>
<td>1,139</td>
<td>818</td>
</tr>
<tr>
<td>CM/GC (n=10)</td>
<td>$23,912,981</td>
<td>662</td>
<td>281</td>
<td>349</td>
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<tr>
<td>D-B/BV (n=10)</td>
<td>$18,604,503</td>
<td>1,420</td>
<td>638</td>
<td>639</td>
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<tr>
<td>Total (n=54)</td>
<td>$21,214,569</td>
<td>1,726</td>
<td>904</td>
<td>699</td>
</tr>
</tbody>
</table>

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What would be possible if the people around you refused to let you fail?

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Reverse Engineering

Engineer: “What kind of retaining walls do you prefer for the soil conditions? Are you thinking precast panels? What other risks do you see?”

Contractor: “Soldier pile walls are best here. I can save time and money with precast deck panels. Let’s take this to the owner for consideration.”

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Osceola County Case Study
(2008 – 2010)

“Most rapidly deployed Program in the nation”

The History (What We Inherited)

- Nearly $1 billion program was way behind schedule
- In 7 Years - 18 Projects (400M) Behind Schedule
- Designs 200% over budget – $5M unaccounted for
- Most recent completed project – $20 million over budget
- Fatal ($100 million) estimating error
Strategic Planning

- Shut all production down until schedules developed and all dollars accounted for
- 18 projects, 6 contracts
- Deliver 18 projects every 18-months to get program caught up
- Employ local contractors
- Failure not an option

“If you aim at nothing, you will hit it every time.” – Zig Ziglar

Why CM/GC?

- Desperation; needed a miracle solution to catch program up
- Reduce project backlog
- Design-Bid-Build could not deliver the results needed
- Design-Build not viable as projects were in various states of disarray

“Vision without action is a daydream; action without vision is a nightmare.” – Japanese Proverb
Unmatched Results

- Most accelerated program in Nation
- 11 major roadway segments in 1-year
- Returned $80 million to local economy in first 4-months of construction
- 11 times previous production
- Returned 36 million dollars in savings to the County’s budget
- Start of design to ground breaking as fast as 15-months
- Saved numerous local contractors from going out of business

“Top 25 Newsmakers of 2009…Veteran Engineer Revives Road Program”
Case Study
(2016 – 2017)

The Objective

- Complete construction of all projects by June 2017 (started in January 2016)
- Commit to a overall budget of $6.9 million (excluding FEMA projects)
- Hire locally from Cibola County
- Innovate to generate time and cost savings
- Stimulate local economy

Deliver a 7-year capital program in 18-months
What types of Projects?

Strategic Planning
2-Day strategic planning meeting at project kick-off
- Project goals
- Preliminary schedule
- Preliminary cost-model
- Communication plan
- Stakeholder strategy
- Risk workshop (not accomplished)
- Team member roles and responsibilities
- Team building
Why CM/GC?

- Reduce project backlog
- Innovation / cost savings
- Rapid delivery
- Success of other agencies
- Better competition
- Economic stimulus

"Great minds discuss ideas; average minds discuss events; small minds discuss people." – Eleanor Roosevelt

Why CM/GC? (Cont’d)

- Similar project efficiencies:
  - Roadway and two connecting parking lots
  - Two bridge replacements
  - 150+ FEMA projects
  - Stabilization/dust control on several dirt roads

"Whether you think you can or you think you can’t--you’re right." – Henry Ford
Results Worth Celebrating

- All projects except for FEMA work and Pinsbaari Rd. Phase B completed in 11 months, including design and FEMA
- Cumulative $1.15 million in cost savings used to fund Pinsbaari Rd. Phase B
- Team overcame major challenges by focusing on solutions versus finger pointing
- First programmatic use of CM/GC on tribal lands

Pawnee Nation, Oklahoma

- First bundling of vertical & horizontal construction with CM/GC
Pawnee Nation, Oklahoma

Pawnee Nation 1st Street Project: Innovative pavement and drainage design; $500k in cost savings

Pawnee Nation, Oklahoma

Design Support for Section 4(f) Analysis for Historic Bridges

Green Bridge rehabilitation – just received funding
Pawnee Nation Fast Cast Bridge Installation Timelapse | January 7, 2020
https://www.youtube.com/watch?v=e1vOwPsCohc
CM/GC MANAGEMENT SYSTEM

- Understand CMGC
- Recruit Team of Experienced Leaders
- Develop Strategic Plan
- Capitalize on Early Contractor Involvement
- Balance Project Risk
- Tailor Project to Schedule & Budget
- Define Clear QA/QC Procedures

CM/GC DM Framework Components

- Overarching
- Fundamental
- Auxiliary

Project Delivery Selection Process

The process is shown in the matrices below and on the previous page. It consists of individual steps to complete the entire process. The steps should be followed in sequential order.

STAGE I - Project Attributes, Objectives, & Constraints

A. Delivery methods to consider:
   1. Design-Bid-Build
   2. Design-Build
   3. Construction Manager - General Contractors

B. Project Description/Objects/Constraints
   1. Project attributes
   2. Site project goals
   3. Determine and review project dependent constraints

STAGE II - Primary Factor Evaluation

A. Assess the primary factors (base factors must often determine the selection):
   1. Delivery Schedule
   2. Cost
   3. Level of Design
   4. Size

B. If the primary factors indicate there is a clear choice of the delivery method, then:
   1. Perform an initial risk assessment for the selected delivery method to ensure risk can be properly identified and managed, and

STAGE III - Secondary Factor Evaluation

A. Perform a pass/fail analysis of the secondary factors to ensure that they are not relevant to the decision.

   1. Staff Experience Availability & Exposure
   2. Level of Overhead & Control
   3. Competition and Contractor Experience

B. Optionally, C & D may be used to compare the methods of delivery, and perform a more rigorous evaluation of all eight factors against the three potential methods of delivery (SDB, DB, and CM/RF).

NOTE: Typically, the entire selection process can be completed by the project team in a single meeting session, as long as each member has individually reviewed and performed the assessment prior to the workshop.

Transportation Construction Management, University of Colorado Boulder
https://www.colorado.edu/tcm/project-delivery-selection-matrix
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