Construction Manager / General Contractor

Tribal Transportation Planning Organization
October 2, 2018
Contractors bid on jobs based on designs already prepared
Owners select the lowest-bidder to do the work
# Delivery Methods

## Common
- Design-Bid-Build (D-B-B)
- Design-Build (D-B)
- **Construction Manager /General Contractor (CM/GC)**

## Less Common
- Multi-Prime Contracting
- Design-Sequencing
- Public-Private Partnership (P3)
- Warranties
1.2: State of the Practice

States with Legislative Authority to use CM/GC
CM/GC - An Integrated Approach

Owner, Designer & CM work collaboratively develop the project scope, optimize the design, improve quality, and manage costs to deliver projects early and under budget.
Traditional D-B-B roles:
CM/GC roles:

- Inspection, Testing, Acceptance
- Engineering & Specialty Studies
- Cost & Schedule Validation
- Suppliers
- Sub-Contractors
- Owner
- Designer
- Independent Cost Estimator
- Contractor
Why are Owners Choosing CM/GC?
What types of Projects?
What did we ask the team to do?

- Complete construction of all projects by June 2017
- Commit to a budget of $6.9 M
- Hire locally from Cibola County
- Innovate to meet these goals
- Work as a team to deliver

Deliver a 7-10 year program in 18 months
What can we celebrate?

Success Stories

- All projects, with exception of FEMA work and T-Intersection, completed in 10 months, including permitting and design
- Cumulative $1.15 million in cost savings used to fund large portion of Pinsbaari Dr. Phase B
- Team overcame significant challenges by always working together on the solution verses pointing fingers
- First programmatic use of CM/GC on tribal lands
- CM/GC delivers big results when properly implemented!
Team formed in January 2016
Broke ground for 1st project in 4 months
Rinconado Bridge designed/constructed within 3 months
Ribbon Cutting Ceremony on Dec 8, 2017

Delivered under Budget
Rinconado Bridge – 15% under budget
Savings moved to Pinsbaari Road

Incorporated leftover block from past project
Re-use of existing guardrail and extruder terminals.
Combined parking lot projects to reduce mobilization
Using millings from Pinsbaari Rd for parking lots

Stone Retaining Wall – 47% under budget
Contractor held 2 job fairs

Innovate!

Delivered a 7-10 year program in 18 months
What did we learn?

- Make sure you have a Project Leader on day one of the project
- Clearly outline the minimum needs in the Request for Proposal
- Cost modeling needs to be discussed at pre-bid and kick-off meeting
- Be more inquisitive during hiring process
- Keep your stakeholders informed as team makes changes
“With the Right Team, Anything is Possible.”
- Kenneth E. Atkins, P.E., Public Works Magazine
Parking Structure
Estes Park, CO
Sacaton Road Bridge
Gila River Indian Community, AZ

- Innovation addressed during selection of CM
- Partnering session recognized as key to success
- Construction risks acknowledged and response planned during design

<table>
<thead>
<tr>
<th>Reduced Traffic Impact</th>
<th>Reduced User Impacts</th>
<th>Reduced ABC slide costs</th>
<th>ABC Cost vs. Fuel Only Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 days +1 weekend vs. 4-6 Months</td>
<td>700K vehicle miles vs. 6M to 9M</td>
<td>$0.4M vs. $0.9M to $1.4M</td>
<td>Savings $0.8M to $1.2M</td>
</tr>
</tbody>
</table>
Osceola, FL - 7 Major Groundbreakings in 1st Year

“The results were that within 1 year, 11 major roadway segments were ready to begin construction, achieving 55 times the production rate at 20% under budget.”

- NCHRP 787
Osceola County, FL - Results

| Fastest Economic Stimulus in the State |
| 90% Local Participation |
| $80+ Million Back in Local Economy in 1st Year |
| 100+ Bid Packages tailored to the Locals. |

“Living at risk is jumping off the cliff and building your wings on the way down.”
- Ray Bradbury
A Tale of Two Bridges

CM/GC Delivery
- 5 week schedule – 1 week ahead
- 10% under Budget
- No change orders. No claims

D-B-B (low bid) Delivery
- 5 week schedule – 1 month behind
- 30% over Budget
- Change orders and claims during construction
TRIBAL NATIONS ARE LEADING IN THE EDC5 INNOVATION OF PROJECT BUNDLING USING CM/GC.

• Acoma Pueblo:
  • First Contract: 9 bundled projects
    • Bridges, road and parking lot paving, stabilization, retaining wall, FEMA repairs, intersection improvements
  • Second Contract: 6 bundled projects
    • Another mix of road, bridge, stabilization, and safety projects

• Pawnee Nation: 13 bundled projects
  • Bridge, lighting, signage, campground and trail improvements, fog seal and paving, building reroofing and another demolished, street safety improvements, added cultural porch and landing, and new playground

• Confederated Salish & Kootenai Tribe: 8 bundled projects
  • Sign installation and upgrades, new maintenance shop, guardrail upgrades, gravel road blading, paving and preservation, bridge replacements
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
Which method?

- Delivery Schedule
- Budget
- Project Complexity
- Innovation Needed
- Level of Design
- Risk or Unknowns
- Staff Experience
- Contractor Experience
- Level of Control
Design Bid Build

Design Build

CM/GC

Selection of both Designer and Builder

Early Construction
CM/GC

Design

RFP

Construction

Early Construction
Which method?

- Delivery Schedule
- Budget
- Project Complexity
- Innovation Needed
- Level of Design
- Risk or Unknowns
- Staff Experience
- Contractor Experience
- Level of Control

Owner: “I hope the bid’s come in within budget. I hope the builder’s qualified. I hope my contingency is sufficient. I hope the plans are constructable with few changes. I wonder what risks are looming? Did we do enough geotechnical exploration?”
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Priority</th>
<th>Estimated Cost (1)</th>
<th>Funding Sources</th>
<th>Design (% Complete)</th>
<th>NEPA Clearance Completed</th>
<th>ROW Needed</th>
<th>BIA Coordination</th>
<th>Construction Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP 32 Pinsbaari Road</td>
<td>High</td>
<td>$2.2 M</td>
<td>Federal</td>
<td>0</td>
<td>No</td>
<td>Maybe</td>
<td>Yes</td>
<td>March 2017</td>
</tr>
<tr>
<td>Riconado Bridge - M122</td>
<td>High</td>
<td>$900K</td>
<td>Federal</td>
<td>0</td>
<td>Re-Eval</td>
<td>No</td>
<td>Yes</td>
<td>June 2016</td>
</tr>
<tr>
<td>Veterans Parking Lot</td>
<td>Med</td>
<td>$90K</td>
<td>State</td>
<td>0</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>March 2016</td>
</tr>
<tr>
<td>E. Pueblo Road and Dihuuna Road  T-intersection</td>
<td>High</td>
<td>$286K</td>
<td>State, Federal</td>
<td>0</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Dec 2016</td>
</tr>
<tr>
<td>FEMA 2013 and 2014 Projects</td>
<td>High</td>
<td>$1,761K</td>
<td>Federal(2)</td>
<td>0</td>
<td>No</td>
<td>No</td>
<td>Yes(3)</td>
<td>June 2016</td>
</tr>
<tr>
<td>Stockyard Bridge (FEMA)</td>
<td>Med</td>
<td>$300K</td>
<td>Federal(2)</td>
<td>90%</td>
<td>No</td>
<td>Yes</td>
<td>Yes(3)</td>
<td>Dec 2016</td>
</tr>
<tr>
<td>Parking Lot Reconstruction Project</td>
<td>Low</td>
<td>$350K</td>
<td>Federal</td>
<td>0</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>June 2016</td>
</tr>
<tr>
<td>Road Stabilizing</td>
<td>High</td>
<td>$450K</td>
<td>Federal</td>
<td>0</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>June 2016</td>
</tr>
<tr>
<td>Road Maintenance</td>
<td>High</td>
<td>$550K</td>
<td>Federal</td>
<td>0</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>June 2017</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$6,887M</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

(1) Includes all project development and construction costs

(2) Available funding cannot be combined with other projects

(3) (3) Consultation with NM DHSEM through Acoma
CM/GC School of Thought

1) Design to Construct Under Budget

2) Provide More Construction for Set Budget
Q & A time
ICE - This is not your Grandmother’s Cadillac
The Basics-Contract Phases

• Preconstruction
  ➢ CM oversees project’s constraints to effectively manage the scope, schedule, and budget
  
  Scheduling, Estimating, Bidding/Procuring Labor and Materials, Supporting Public Outreach, Coordinating environmental permits, or developing relocation plans for businesses and landowners.

• Construction
  ➢ CM retains management
  ➢ Acts as prime Contractor (GC) delivering labor, equipment and materials to complete each work package

  Purchasing, on-site and off-site construction, fabrication, contract administration, progress meetings, produces progress schedules, shop drawings, payment applications, record documents, and as-builts.
CM/GC Essentials

Top-down Leadership for All Partners
- i.e., the ones with binding, decision-making authority—be present at all weekly production meetings

Influencers in the Room
- Subs and Consultants at the Table when coming up with Work Packages and prices

Cost Estimates are Bid Prices
- Formulate the rough and final GMPs based on real bids
CM/GC Essentials

Upfront Cost Control
• Layout cost of all cumulative GMPs prior to starting early work packages

Budget for Contingencies and Allowances
• Enables real-time decisions to allow the project to move forward.

Zero Tolerance for Change Orders
• Innovation is required to ensure no change orders and extra work is zeroed out.
Contractor Fees

Osceola, Florida
Case Study Finding
Project Goals & Objectives

• Use a “no frills/bare bones” approach to design plans to rapidly deliver a suite of quality projects under budget;

• Work cooperatively with Owner, the Design Consultants, and stakeholders to maintain an aggressive and cost effective schedule;

• Use innovation to provide improved quality and performance and generate significant project savings;

• Maintain a strong positive relationship with major stakeholders, cultivate a partnering attitude, promote a creative environment, and be proactive in addressing project needs;
Project Goals & Objectives

• Provide a context-sensitive project using smarter construction methods for low maintenance and long term performance;

• Provide a safe working and traveling environment that minimizes the potential for injuries to the public and construction workers;

• Minimize inconvenience to the public by minimizing construction time and delays; and

• Deliver early work packages to ensure early construction is underway two one month after Notice to Proceed and this suite of projects is rapidly taken “off of the books”.
## Procurement Procedures

<table>
<thead>
<tr>
<th>Category</th>
<th>Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>- Low Bid</td>
</tr>
<tr>
<td></td>
<td>- Best Value</td>
</tr>
<tr>
<td></td>
<td>- Qualifications-Based</td>
</tr>
<tr>
<td></td>
<td>- Cost Plus Time (A+B)</td>
</tr>
<tr>
<td>Less Common</td>
<td>- Sole Source</td>
</tr>
<tr>
<td></td>
<td>- IDIQ Contracting (MATOC or SATOC)</td>
</tr>
<tr>
<td>Supplementary</td>
<td>- Alternative Technical Concepts</td>
</tr>
<tr>
<td></td>
<td>- Additive Alternates</td>
</tr>
</tbody>
</table>
Procuring the CM

Best Value Proposal
(Technical Evaluation + Price) – Must have a price component

- Brings the traditional mindset of bidding the work.
- Potential to obtain low bid Sub-Contractors.
- Qualifications can be compromised by price
- Responds to a partial design rather than asking how the CM would construct
- Best value focused on General Contractor

Qualifications Based Selection
(Professional Services) – Simplest and Fastest Method

- Owner not influenced by price; team selection based on qualifications and past performance
- A goal motivated team is more efficient than a price oriented team resulting in a need for significantly fewer staff
- Teams not initially tied to selection price components have greater latitude to use innovation, unique construction approaches, sustainable design, etc...
- QBS focused on the Construction Manager
## Delivery Method Comparisons

<table>
<thead>
<tr>
<th>Project Traits</th>
<th>D-B-B</th>
<th>CM/GC</th>
<th>D-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Management</td>
<td>Very limited</td>
<td>Very effective</td>
<td>Best for risk shifting</td>
</tr>
<tr>
<td>Collaboration With Designer &amp; Contractor</td>
<td>Very limited</td>
<td>Very collaborative</td>
<td>Moderate collaboration, contratual limitations</td>
</tr>
<tr>
<td>Price Certainty</td>
<td>None, subject to over-runs and change orders</td>
<td>Very effective, early price certainty during project development</td>
<td>Very effective, early price certainty during project development</td>
</tr>
<tr>
<td>Schedule Acceleration/Compression</td>
<td>No ability to overlap design &amp; construction, can accelerate construction with A+B</td>
<td>Ability to overlap design &amp; construction, ability to optimize schedule not just accelerate</td>
<td>Ability to overlap design &amp; construction, very effective for accelerating project delivery</td>
</tr>
<tr>
<td>Construction Quality</td>
<td>Low bid can compromise quality</td>
<td>Very beneficial to building a quality project</td>
<td>Very beneficial to building a quality project</td>
</tr>
</tbody>
</table>
“We can’t solve problems by using the same kind of thinking we used when we created them.”

Albert Einstein