AAPA Executive Management Conference

May 9, 2019  |  Facilities Engineering
Donald Brinkman, PE, PPM
Topics

• Information Technology in Engineering and Construction
  • Bidding
  • Online Project Management & Collaboration
• Geographical Information Systems (GIS)
  • Asset Management
• Project Delivery
• Rehab + Reconstruction + CMAR
  • Success Story in the making
Software - Bidding

- Online bidding required in some states.
- La. requires Bid Express
- Used for RFP and general procurement
Online Project Management & Collaboration

**DEFINED:**

Cloud-based software designed to improve project communication and collaboration
Software

- 40% increase in clients each year for last 5 years
  - New Orleans
  - Jacksonville
  - Olympia

- Online bidding module

- 70% increase in companies using Procore

- 70% increase in people using Procore
• Port of Lake Charles Portfolio
  • Projects
  • Why did we migrate?
  • Board Submissions
  • Discussion on placing environmental permits, etc in file
How long ago was that submitted?

Was I the hold up?

Did the drawings get delivered to the right person?

File is too big to email.

Where is that file?
Collaboration

• Allows you to keep your team informed and involved.

• Easily add your internal stakeholders to the team.
  • **Operations**: Stevedores, terminal operators
  • **Police/EMS**: Notification of road closers

• Document stakeholder response/approvals
# Geographical Information Systems

<table>
<thead>
<tr>
<th>Engineering</th>
<th>Asset Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>Business Development/Real Estate</td>
</tr>
</tbody>
</table>

AAPA Executive Management Conference
Project Delivery

• Design, Bid, Build

• Early Contractor Involvement (ECI)
  • Construction Manager (CM) at Risk

• Design-Build
  • Type of Public Private Partnership (PPP)
  • Expanded: Design, Build, Operation, Finance & Maintain

• Integrated Project Delivery
Design Bid Build

Owner

GC

A/E

Sub

Sub
CM @ Risk

Owner

CM

A/E

Sub

Sub
Design - Build

Owner

DB Entity

Construction Sub  Technical Sub
Integrated Project Delivery

Owner

GC

A/E

AAPA Executive Management Conference
Designer Procurement

It starts with the Owner

If your process calls for an SOQ, RFQ or RFP

• State what you want
  • Experience
  • Innovators
  • No subconsultants
  • Price?

• Include a legal statement that they are attesting to their abilities and experiences
  • Submission of a RFQ shall constitute an attestation by the entity submitting the RFQ that all statements and material submitted are true and correct and any statement or information found to be untrue or incorrect or misleading by the District shall, in the sole discretion of the District, constitute grounds to disqualify the contractor providing such RFQ
Change Orders

• Disliked
• Over budget
• Whose fault
  • Owner induced
  • Designer covering themselves
  • Contractor taking advantage of contractors

Solutions

• Select correct project delivery method
• Pre-Construction due diligence
• Owner-Designer contract language on errors/omissions
• Owner-Contractor contract language
• Dispute resolution board
CMAR Project Case Study

<table>
<thead>
<tr>
<th>Owner</th>
<th>Project Funding</th>
<th>Project Scope</th>
</tr>
</thead>
</table>
| Lake Charles Harbor & terminal District (Port of Lake Charles) a Political Subdivision of the State of Louisiana. | 100% Port.  
Original budget estimate was $4M.  
No State or Federal funds. | Replace conveyor belt infrastructure critical to support CITGO and P66 loading operations. |
CMAR Justification

September 8, 2015
Hosted a Project Delivery Strategy Workshop with Stakeholders

Project-Specific Goals Identified

• Operate During Construction
• Stay in Budget
• Operable and Maintainable Systems
• Expedited Construction Schedule due to adjacent Operations
Procured $500,000 worth of long lead items prior to a construction contract. Saved the project 6 months.

Engineering time and construction dollars were saved in plan development and reviews (collaboration). Contractor offered alternatives that reduced engineering time and saved $400,000 in construction.

We were able to work around a maximum allowed 30 day outage required by one of the project stakeholders. Conveyor needed to be operational on day 31 and it was.
Milestones

- KickOff Meeting: 7/12/16
- Ready for Bid: 11/23/16 → 3/16/17
- Execute Construction Contract: 2/8/17 → 6/18/17
- Issue NTP to Contractor: 3/6/17
- Substantial Completion: 8/2/17 → 5/14/18

AAPA Executive Management Conference
# Financials

<table>
<thead>
<tr>
<th></th>
<th>Owners' Estimate/Budget</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual Scope</td>
<td>$4,006,555</td>
<td>$3,205,300</td>
</tr>
<tr>
<td></td>
<td>(includes engineering fee)</td>
<td>(construction only)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Engineer</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>60% Design Estimate</td>
<td>$4,670,000</td>
<td>$4,786,792</td>
</tr>
<tr>
<td>90% Design Estimate</td>
<td>$4,620,000</td>
<td>$4,435,686</td>
</tr>
<tr>
<td>Guaranteed Max Price (GMP)</td>
<td>$4,750,000</td>
<td>$4,366,799</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>GMP</th>
<th>Change Order</th>
<th>Final</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Cost</td>
<td>$4,366,799</td>
<td>$133,257</td>
<td>$4,500,057</td>
<td>3%</td>
</tr>
</tbody>
</table>

*10 year change order average on Port projects – 13%*
CMAR Conclusions

• Desired outcomes achieved
• Saved money and most importantly time
• Change Orders were Owner requested and significantly below Owner average
• Still had issues common to Design/Bid/Build such as punch list and warranty items
Road Trip Ideas

• Construction of Berth and Shed 1 Costs and Issues.
  • Must be a quicker and cheaper way

• Brainstorm
  • Lt weight aggregate behind bulkhead
  • Different project method delivery

• Berth 2/3 Lessons Learned into Practice
  • Concept
  • CMAR
  • Rehab
Rehab vs. Reconstruction

• Technologies in rehabilitation
  • Carbon Fiber
  • Pile Wrapping
  • Roof Membranes
  • Soil Treatment
CMAR Collaboration

• Conversation with contractor led to a meeting with a structural engineering firm specializing in carbon fiber reinforcement.

• After initial meeting we realized this could save time and money.
<table>
<thead>
<tr>
<th>Reconstruct wharf only</th>
<th>Reconstruct Shed and Berth 1 reconstruct</th>
<th>Reconstruct Berth 2/3</th>
<th>Rehab wharf section</th>
</tr>
</thead>
<tbody>
<tr>
<td>$136/SF</td>
<td>$174/SF</td>
<td>$225/SF</td>
<td>$62/SF</td>
</tr>
<tr>
<td>Yields a capacity of 500-1000 PSF</td>
<td>Capacity @ 1200 PSF</td>
<td>Capacity @ 2000 PSF</td>
<td>Capacity 1000-2000</td>
</tr>
</tbody>
</table>
Dynamic Adaptive Policy Pathways
<table>
<thead>
<tr>
<th>Project Description</th>
<th>Cost per SF</th>
<th>Capacity Details</th>
<th>Construction Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconstruct wharf only</td>
<td>$136/SF</td>
<td>Yields a capacity of 500-1000 PSF</td>
<td>Built in 2004</td>
</tr>
<tr>
<td>Reconstruct Shed and Berth 1 reconstruct</td>
<td>$174/SF</td>
<td>Capacity @ 1200 PSF</td>
<td>Built in 2014</td>
</tr>
<tr>
<td>Reconstruct Berth 2/3</td>
<td>$225/SF</td>
<td>Capacity @ 2000 PSF</td>
<td>Planned construction 2019/2020</td>
</tr>
<tr>
<td>Rehab wharf section</td>
<td>$62/SF</td>
<td>Capacity 1000-2000</td>
<td>Planned construction 2019/2020</td>
</tr>
</tbody>
</table>
Key Takeaways

• Fully utilize your technology to solve problems across your enterprise.
• Set yourself up to select the best consultant, then trust but verify.
• Use the best project delivery method for your project.
• Try to incorporate a design process (DAPP) that will get you to the end goal with a variety of paths.
• Challenge the project team.
Thank You

Donald Brinkman, PE, PPM
donald.brinkman@csrsinc.com