CAPSTONE: CORRELATION BETWEEN ACQUISITION METHOD AND CONSTRUCTION COST GROWTH

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Acting Chief Construction Division
15 Nov 2018
CAPSTONE OVERVIEW

- Why Construction Cost Growth
- Acquisition Methods
- Goals and Objectives
- Literature Review
- Methodology
- Results and Analysis
- Summary/Recommendations
WHY CONSTRUCTION COST GROWTH (CCG)

- Cost growth can be very difficult to deal with
- Lack of Contingency
- Anti-deficiency Act (ADA)
- Three possible solutions
- Contractor plays a large role
ACQUISITION METHODS

• Low Price

• Sole Source

• Best Value Trade Off

• Design Build Two Step
  • Best Value Trade Off (BVTO)
  • Lowest Price Technically Acceptable (LPTA)
GOALS AND OBJECTIVES

- What affect does Acquisition Methods have on CCG?
- What are the causes of CCG?
- How can cost growth be reduced?
# USACE CONTRACT TOOLBOX

<table>
<thead>
<tr>
<th>Long Name</th>
<th>Short Name</th>
<th>Acquisition Method</th>
<th>Contract amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Orientated Construction Activity</td>
<td>POCA</td>
<td>Sole Source</td>
<td>&lt;$4M</td>
</tr>
<tr>
<td>Single Award Task Order Contract</td>
<td>SATOC</td>
<td>BVTO</td>
<td>&lt;$30M</td>
</tr>
<tr>
<td>Design Build Multiple Award Task Order Contract</td>
<td>DB MATOC</td>
<td>BVTO or LPTA</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Invitation For Bid</td>
<td>IFB</td>
<td>Low Price</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Two Step Design Build</td>
<td>DB II Step</td>
<td>BVTO</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Indefinite Delivery/Indefinite Quantity</td>
<td>IDIQ</td>
<td>BVTO</td>
<td>&lt;$30M</td>
</tr>
</tbody>
</table>
## EITHER/OR REVIEW

### Construction Cost Growth Causes

<table>
<thead>
<tr>
<th>Either</th>
<th>Or</th>
<th>Current Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to contractor award</td>
<td>Post contract award</td>
<td>Post contract award</td>
</tr>
<tr>
<td>USACE driven</td>
<td>Customer driven</td>
<td>Government Driven</td>
</tr>
<tr>
<td>Contractor Point of view</td>
<td>Owner point of view</td>
<td>Owner point of view</td>
</tr>
<tr>
<td>Controlled</td>
<td>Uncontrolled</td>
<td>Controlled</td>
</tr>
<tr>
<td>Engineering based</td>
<td>Soft Skills based</td>
<td>Soft Skills based</td>
</tr>
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</table>
## POST CONTRACT AWARD COST GROWTH

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Award Contract with Options</td>
<td>$19,512,600.00</td>
</tr>
<tr>
<td>Modifications</td>
<td>$691,914.00</td>
</tr>
<tr>
<td>Current Contract</td>
<td>$20,204,514.00</td>
</tr>
<tr>
<td>Pending Changes</td>
<td>$444,232.00</td>
</tr>
<tr>
<td>Estimated Contract</td>
<td>$20,648,746.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Changes</td>
<td>$0</td>
</tr>
<tr>
<td>Engineering</td>
<td>$500,000</td>
</tr>
<tr>
<td>Construction</td>
<td>$300,000</td>
</tr>
<tr>
<td>Other Changes</td>
<td>$200,000</td>
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</tbody>
</table>

*4% COST GROWTH - GREEN*
SOFT SKILLS

- Soft skills defined
- Conflict is a common theme
- Contractor delays
- Goal of an acquisition method
FURTHER RESEARCH

- Acquisition methods vs. CCG
- Strength and weakness of each tool
- Construction 101
METHODOLOGY

Quantitative
- Project data that includes cost growth and time growth
- Resident Management System
- Need project data from different resident offices

Qualitative
- Interviews
- Thirteen Resident Engineers from nine districts
- Open ended questions

<table>
<thead>
<tr>
<th>Award Contract with Options:</th>
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<td>$444,232.00</td>
</tr>
<tr>
<td>Estimated Contract:</td>
<td>$20,648,746.00</td>
</tr>
</tbody>
</table>

4% COST GROWTH

US Army Corps of Engineers
QUANTITATIVE

- Cost growth/time growth defined
- Cover full range of acquisition methods
- Three different resident offices/two districts – 408 projects

<table>
<thead>
<tr>
<th>Project #</th>
<th>Acquisition</th>
<th>Original Contract $</th>
<th>Cost Growth</th>
<th>Time Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BYTO</td>
<td>$31,200,000</td>
<td>2.6%</td>
<td>5.8%</td>
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<tr>
<td>2</td>
<td>BYTO</td>
<td>$57,280,142</td>
<td>6.2%</td>
<td>29.4%</td>
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<tr>
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<td>BYTO</td>
<td>$105,500,000</td>
<td>0.1%</td>
<td>10.8%</td>
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<tr>
<td>4</td>
<td>BYTO</td>
<td>$32,775,000</td>
<td>1.2%</td>
<td>18.6%</td>
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<tr>
<td>5</td>
<td>BYTO</td>
<td>$28,564,921</td>
<td>-1.2%</td>
<td>0.0%</td>
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<tr>
<td>6</td>
<td>BYTO</td>
<td>$9,080,163</td>
<td>0.0%</td>
<td>3.9%</td>
</tr>
<tr>
<td>7</td>
<td>BYTO</td>
<td>$13,667,345</td>
<td>-0.1%</td>
<td>5.8%</td>
</tr>
<tr>
<td>8</td>
<td>BYTO</td>
<td>$4,098,434</td>
<td>-0.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>9</td>
<td>BYTO</td>
<td>$34,200,000</td>
<td>-0.4%</td>
<td>10.8%</td>
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<tr>
<td>10</td>
<td>BYTO</td>
<td>$6,240,000</td>
<td>-0.7%</td>
<td>1.8%</td>
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<tr>
<td>11</td>
<td>BYTO</td>
<td>$17,046,396</td>
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<td>2.7%</td>
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<tr>
<td>12</td>
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<tr>
<td>13</td>
<td>BYTO</td>
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<td>20.0%</td>
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<tr>
<td>14</td>
<td>BYTO</td>
<td>$15,294,000</td>
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<td>7.5%</td>
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<tr>
<td>15</td>
<td>BYTO</td>
<td>$16,832,000</td>
<td>4.5%</td>
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<tr>
<td>16</td>
<td>BYTO</td>
<td>$4,379,838</td>
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<td>0.0%</td>
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<tr>
<td>17</td>
<td>BYTO</td>
<td>$6,694,800</td>
<td>0.4%</td>
<td>2.6%</td>
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</tbody>
</table>
QUALITATIVE

- Office Profile/Acquisition Methods Used
- Which methods do better with CCG?
- Delays/Contingency
- Steer questions as necessary

The intent of this questionnaire is to determine which of the commonly used USACE acquisition method perform the best/worst in regards to cost growth.

Name:
Date:

Resident Office Profile
Type of Work
MILCON
Military O&M
International and Interagency Services (IIS)
Civil Works

Approximate # of Projects Last Five Years:
Average Size of Projects:

1. What type of contracts does your office deal with?
   For each type of contract ask the following questions:
   - How is the acquisition method with contract changes?
   - How is the acquisition method with cost growth?
   - How is the acquisition method in dealing with delays?
   - How is the acquisition method with partnering/conflict?
   - What are the good and bad in using this acquisition method?

2. What are the best and worst contract types? Why?

3. What other items would you like to bring up regarding contract types?
RESULTS – QUANTITATIVE

- 36 projects – Avg size = $22.6M
- 1.8% vs. 4.1%
- 13.2% vs. 13.7%
- Design build vs. Design bid build
RESULTS – QUANTITATIVE

- **269 projects** – Avg size = $1.0M

- **DBMATIC - LPTA 9.3% vs.**
  - 3.4%, 4.5% and 5.4%

- **DBMATIC - LPTA 42.5% vs.**
  - 0%, 11.7% and 33.0%

- Design build vs. Design bid build
RESULTS – QUANTITATIVE

- 103 projects – Avg size = $2.2M
- BVTO – 2.9% & 133.30%
- Handling of delays
  - Low cost methods vs. past performance

Resident Office #3

US Army Corps of Engineers
QUALITATIVE – INTERVIEW RESULTS

- Sole Source contracts/POCAs
- DBMATOC
- Invitation for Bids (IFB)
- Best Value Trade Off (BVTO)
QUALITATIVE – INTERVIEW THEMES

• The most important thing regarding cost growth is to get right contractor

• Design build does better than design bid build

• From the construction team’s point of view, contractors that are trying to build long term relationships do better

• Smaller contractors have more trouble at the beginning and require more effort by the personnel in the resident office

• Contracts that incorporate lessons learned do better
SUMMARY

- Regardless of the delivery method, the best value trade off acquisition method yields better results in regards to construction cost growth.

- Acquisition methods that foster long term relationships between contractors and the government tend to handle projects delays in a more cost efficient manner.

- Using the Lowest Price Technically Acceptable acquisition method for the design build delivery method yields the worst results in regard to construction cost growth.
CONSTRUCTION COST GROWTH ACQUISITION LOOP

Acquisition Method

Obtain the best contractor

Lower CCG

Better Past Performance

US Army Corps of Engineers

U.S. Army
RECOMMENDATIONS/FURTHER RESEARCH

• Maximize use of past performance information

• Regarding the USACE toolbox, use best value trade off when possible including design bid build

• Avoid using LPTA for DBMATOC

• Research with more project offices across several government agencies
QUESTIONS?

I'M EXHAUSTED FROM ALL OF THE BASIC RESEARCH I'M DOING.

IT'S TOO BAD THAT THE VALUE OF MY WORK WON'T BE QUANTIFIABLE FOR ANOTHER TEN YEARS.

I'D LIKE TO SEE YOUR LAB REPORT.

SO... THE NEW RULE IS THAT WE WRITE DOWN STUFF?
Santa Barbara County Debris Flows (Final Story Board) As of 18 April

Critical Events next 24 hours: Final inspection of Santa Monica Plunge Pool scheduled for 18 April 2018.

Past 24 hours: Completed debris removal from the Santa Monica Plunge Pool.

Next 24-48 hours: Final Inspection of the Santa Monica Plunge Pool. Demobilize equipment and personnel. Continue monitoring close out operations.

Authorities (Stafford Act)/Appropriation: (as of 23 MAR)
- Initial amount Received: $31M
- Additional amount received for basin debris removal: $49M
- Additional amount received for channel debris removal: $30M
- Additional amount received for equipment mobilization: $400K
- Total amount Received: $110.4 M

Area of Operations (Cities):
- Montecito, CA; Summerland, CA; Toro Canyon, CA; Carpenteria, CA; Buellton, CA; Santa Paula, CA

USACE Debris Personnel Activated: 34 PAX (as of 17 APR)
- Mission Management Cell: 1; SPL Reachback: 33; Field 0

Messaging: The U.S. Army Corps of Engineers Los Angeles District is working in partnership with local, state and federal agencies in response to the devastating California wildfires and the resulting floods in Santa Barbara County. Our number one priority is the life, safety and welfare of those affected by this disaster. We will do everything in our power to aid in the recovery effort.

Limitations: None
Risk: None

Channel Debris Hauling Mission

(Debris data as of COB 17 APR, FINAL REPORT)
- Total Basin Debris Removed: 338,884 CY
- Total Channel Debris Hauled: 61,131 CY
- Number of Debris basins: 11
- Number of channel reaches: 11
- Basins in progress: 0
- Hauling reaches in progress: 0
- Basins completed: 11
- Hauling reaches completed: 11

Percent Complete of Total: 100%
Santa Barbara Debris Flows (18 APR 18)
Basin Debris Removal Status

Total Est to be Removed: 338,884 CY
Total Removed: 338,884 CY
Percent Complete: 100%

Montecito: 2,325 CY removed
Cold Springs: 24,782 CY removed
San Ysidro: 21,747 CY removed
Romero: 43,216 CY removed
Toro East: 15,151 CY removed
Arroyo Paredon: 24,029 CY removed
Santa Monica: 154,985 CY removed
Toro Upper West: 15,916 CY removed
Toro Lwr West: 12,277 CY removed
Santa Monica Plunge Pool: 10,454 CY removed
Franklin: 1,162 CY removed
Gobernador: 11,408 CY removed

<table>
<thead>
<tr>
<th>Priority</th>
<th>Debris Basin Name</th>
<th>Contract Award Date (A) Actual (E) Estimated</th>
<th>Completion Date (A) Actual (E) Estimated</th>
<th>KTR Name</th>
<th>Award Amount</th>
<th>Volume To Be Removed by SOW (CY)</th>
<th>Status of Removal (Truck Loads)</th>
<th>Status of Removal (Cubic Yards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Montecito Debris Basin</td>
<td>11-Jan-2018 (A)</td>
<td>23-Jan-2018 (A)</td>
<td></td>
<td>$</td>
<td>2,325</td>
<td>163</td>
<td>2,325</td>
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<td>2</td>
<td>Cold Springs Debris Basin</td>
<td>11-Jan-2018 (A)</td>
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<td>Gobernador Debris Basin</td>
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<td>$</td>
<td>11,408</td>
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<td>11,408</td>
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<td>Santa Monica Debris Basin</td>
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<td>8,514</td>
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<td>6</td>
<td>San Ysidro Debris Basin</td>
<td>13-Jan-2018 (A)</td>
<td>31-Jan-2018 (A)</td>
<td></td>
<td>$</td>
<td>43,216</td>
<td>4,177</td>
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<td>$</td>
<td>24,029</td>
<td>1,903</td>
<td>24,029</td>
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<td>Arroyo Paredon Debris Basin</td>
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<td>09-Feb-2018 (A)</td>
<td></td>
<td>$</td>
<td>15,916</td>
<td>1,460</td>
<td>15,916</td>
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<td>Toro, Lwr West Debris Basin</td>
<td>28-Jan-2018 (A)</td>
<td>08-Feb-2018 (A)</td>
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<td>$</td>
<td>15,151</td>
<td>1,389</td>
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<td>$</td>
<td>12,277</td>
<td>881</td>
<td>12,277</td>
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<tr>
<td>11</td>
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<td></td>
<td>$</td>
<td>11,976</td>
<td>872</td>
<td>11,976</td>
</tr>
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TOTALS: 338,884