Transportation Forum Coordinator: Wendy Dyson (absent)

GENERAL ITEMS:
- Welcome (Mario Macrina, AECOM)
- Introductions
- Next meeting February 7th, 2017; Michael L. 'Sully' Sullivan, ACEC Georgia Legislative Update

Survey Committee update: Tate Jones
- Shared discussion/concerns (Benny Walden)
  - Recommendation to use all methods available to communicate with home owner/property owner.
  - Also, under no circumstances is the surveyor to cut down or clear without the property owner’s being aware of field work.

Construction Cost Estimate Issues & Lessons Learned, by Erik Rohde, GDOT Office of Engineering Services

Presentation document follows notes

- ‘Reality Check’
  - Many issues = ‘it is a lot of small errors that add up.’
  - Use judgement to establish Unit Price
  - GDOT Policy and Procedure 3A-9
  - Gut Checks at each phase (Concept, PFPR, FFPR, annual updates or costs have increased or decreased 10%)
    - Unclassified Excavation – ‘Is it a waste job? Likely Location to waste identified?’
    - Signing and Marking – can be LS in Concept Phase, but if Level of Design is there, then itemize quantities and provide at concept stage
  - 70% of estimates being ‘RETURNED’ vs Letting
  - 2017 Programmed cost comparison 55 projects = 36.2% increase: $626 Million (last estimate updates) to $852.4 Million (low bids)
  - 2017 Bridge Replacements 20 projects = 41.6% increase from Designer estimates to Low bid

- ‘Can We Do Better”: Programming Construction Funds Depends on it – more details presentation slides

- “Lessons Learned” more details presentation slides
  - PAY ITEMS
    - Hot Mixed Asphalt (HMA) – often incorrect – Guidance document is on GPTQ webpage
    - Look at correlation between items
    - Include bridge items (develop from bridge plans) instead of LUMP SUM items
    - Stop overuse of Grading Complete – missed opportunity if wait till last minute
    - Stop missing obvious items -i.e. roundabouts truck apron
  - QUANTITIES
    - Math errors – where is QC/QA
    - Lack of experience – not able to visualize quantities
    - Missing quantity relationships between items
    - Earthwork mistakes – shrinkage and swelling
  - UNIT PRICES
    - It is not just Lump Sum items
    - Bad item history from CES
    - Location information from CES
    - Over reliance on CES
    - Not understanding manual entry in CES
    - Lack of experience – not able to visualize quantities
    - Not using current Item Mean Summary for bid item prices
    - Not using Bid Tabs from letting to support LS prices
    - No Reality Check applied
Lessons Learned” continued

- COST CHANGES AT LETTING
  - Bridge Replacement Projects – mainly Bad Prices
    - Complexity of Project
    - Earthwork – shoring, clearing and grubbing being included in Grading Complete
  - Other Projects – a mix of little things
    - Missing items
    - Quantity changes
    - Traffic Control and Earthwork

WHAT HAPPENS? Albert Shelby

- Lose PE – affecting monies marked for other projects
- STIP amendment required if over 20% change
- QA/QC signature required for milestone submittals and cost estimates. If bad reviews and issues -this will affect your firm and firm’s prequalification
- GDOT is pulling old projects to compare
- State funded – more design to budget concepts. Need to get it right early.

Information was condensed from Forum meeting notes provided by Rob Lewis. Please send any additions and/or revisions to Ossie Brewer, obrewer@dpengr.com  Thank You!
Construction Cost Estimate
Issues & Lessons Learned

GDOT Office of Engineering Services Perspective
Erik Rohde
Office of Engineering Services - Role

• Programmed Cost Estimate Updates Are Submitted to Us for Review & Processing
• Review Role Has Expanded
• We Have 2 People
• All We Have is the Estimate
  – We Search for Additional Information
• We Compile and Submit to Program Control then Chief Engineer before OFM Updates Costs
• We Also Review Concept Reports
What Are The Issues?

• Construction Cost Estimate Challenges
  – Pay Items and Quantities
  – Unit Prices
  – Not Submitted In A Timely Manner

• Construction Cost Changes At Lettings
  these items above are essential to success with

• Programming Construction Funds
Estimate Challenges Examples – Pay Items

• Missing
  – new 160-ft x 38.25-ft bridge cost
  – Clearing and Grubbing for 10.02-miles of reconstruction and widening
    • Submitted August 28, 2017
    • FFPR was held March 2017. February 2018 let date

• Incorrect
  – Earthwork Items
    • Unclassified Excavation and Inplace Embankment
    • Clearing & Grubbing and Grading Complete
    • Unclassified Excavation/Borrow Excavation without Clearing & Grubbing
  – Recycled Asphaltic Concrete Surface Course
    • Without Hydrated Lime
    • Wrong Surface Course Aggregate Group
Estimate Challenges Examples – Quantities

• Approach Slab quantity of 10,050 SY for a single bridge with an estimated cost of $1,893,471
  – Proposed bridge estimated cost was $1,327,500.
• 1,700 Construction Exits - $2,473,725
• 1,900 CY of Flowable Fill – would fill about 29,000-ft of 18-inch pipe
• 1,796 LF of MSE Wall Traffic Barrier questioned
  – Revised to 4,807 LF of Barrier and 400 LF of Coping – increased estimate $697,177.
• Class A Concrete quantity of 10,773 CY for one Box Culvert – over $10,000,000
• HMA quantities questioned
  – Revised increased by 76,177 TN – about $6 Million
Estimate Challenges Examples – Unit Prices

• Removal of Existing Bridge - $6.82/SF
• $7,000 for Grading Complete on Bridge Replacement Project
  – Revised estimate had $19,700
• $27.00/SY for 184,000 SY of 10.5-inch Plain PC Conc Pvmt
• $5.22/CY for 3,130,000 CY of Unclassified Excavation
  – Cross Sections up to 400-ft wide and 140-ft cut
Estimate Challenges – Timely Submission

• GDOT Policies & Procedures 3A-9
  – Concept Development Phase Cost Estimate
  – Preliminary Field Plan Review (PFPR) Cost Estimate
  – Final Field Plan Review (FFPR) Cost Estimate
  – Annual Update
  – Anytime There’s a 10% Increase or Decrease

Which One Of The Above Is Not Getting Done?

ANYTIME THERE’S a 10% INCREASE or DECREASE
Timely Submission – Is The Focus Right

- On Time is Useless if the Estimate is Bad
- FFPR Cost Estimate Update is Too Late for Large Changes
- Designers and Those Providing QC/QA Reviews Need to Focus on Quality
## Estimate Challenges – Update Submittal Review Results

<table>
<thead>
<tr>
<th>June 15, 2017 though December 4, 2017</th>
<th>Total</th>
<th>Submitted as Initially Received for Approval</th>
<th>Returned to Project Manager for Correction and Resubmittal</th>
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<tr>
<td></td>
<td>Number</td>
<td>Number</td>
<td>Percentage</td>
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<tr>
<td>Projects Submitted with CES Available</td>
<td>291</td>
<td>108</td>
<td>37.1%</td>
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<td><strong>Breakdown by Submission Number from Project Manager</strong></td>
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<td><strong>First Submission</strong></td>
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<td><strong>Second Submission</strong></td>
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<td>Fifth Submission</td>
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Construction Cost Increases At Lettings - 2017

63 Projects

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<th>Designer</th>
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<tr>
<td>1625</td>
<td>814.8</td>
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<tr>
<td>Engineer's</td>
<td>898.0</td>
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<tr>
<td>Low Bid</td>
<td>870.3</td>
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</table>

20.7% Increase from Designer Estimate
3.2% Decrease from Engineer's Estimate
Construction Cost Increases From Last Programmed Cost Estimate Update to Letting - 2017

55 Projects

$900
$800
$700
$600
$500
$400
$300
$200
$100
$-

Millions

626.0
852.4

36.2% Increase from Last Programmed Cost Estimate Update

- Last Update
- Low Bid
20 Projects

<table>
<thead>
<tr>
<th>Cost in Millions</th>
<th>Designer</th>
<th>Engineer's</th>
<th>Low Bid</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>153.1</td>
<td>216.7</td>
<td>229.6</td>
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<tr>
<td></td>
<td>41.5% Increase from Designer Estimate</td>
<td>5.9% Decrease from Engineer’s Estimate</td>
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</table>

41.6% Increase from Designer Estimate
5.9% Decrease from Engineer’s Estimate
Construction Cost Increases From Last Programmed Cost Estimate Update to Letting – 2017 Bridge Replacements

19 Projects

50.0% Increase from Last Programmed Cost Estimate Update

Last Update: $143.2
Low Bid: $214.8
Can **WE** Do Better?

- Pay Items and Quantities – Most Certainly
- Unit Prices – Can Be a Challenge but Yes
- Not Submitted in a Timely Manner - Yes
- Construction Cost Changes at Lettings – Yes
- Programming Construction Funds - ???

Dependent on the Items Above
Lessons Learned – Pay Items

• Hot Mixed Asphalt – Often Incorrect
• Lack of Correlation Between Items
• Individual Bridge Items vs. Lump Sum Item
• Overuse of Grading Complete
• Missing Obvious Items
Lessons Learned – Quantities

• Simple Math Errors
• Not Able to Visualize Quantities and Units
• Lack of Quantity Relationships Between Items
• Earthwork is Often Calculated Incorrectly
• No Reality Check
Lessons Learned – Unit Prices

• It’s Not Just Lump Sum Items
• Bad Item History Being Used in CES
• Location Information in CES
• Over Reliance on CES
• Not Understanding Manual Price Entries in CES
• Not Using Item Mean Summaries
• Not Using Bid Tabs from Lettings to Support Lump Sum Prices
• No Reality Check
Lessons Learned – Cost Changes at Letting

• Bridge Replacement Projects – Mainly Bad Prices
  – Complexity of Construction
  – Earthwork

• Other Projects – Items, Quantities, and Prices
  – Missing Items and Quantities
  – Quantity Changes
  – Traffic Control and Earthwork Prices
Lessons Learned – Time for My Opinions

• Engineer’s are Supposed to Solve Problems
• Since Our Designers are Engineers Why Do We Have This Problem – 2 Possibilities to Consider
  – They Aren’t Putting Forth the Effort Needed
  – They Aren’t Any Good At It
• How Would I Grade Engineering Services (A to F scale)
  – Reviewing Estimates: C+
  – Helping Solve the Problem: D-
• How Would You Grade Your Organization?