

Cost Estimate QC-QA Best Practices: PROCESS

- WHAT is the overall task?
 - Develop accurate and complete pay items, quantities, and prices for items we design
 - Input pay items and quantities from other offices/disciplines/Subject Matter Experts (SME's) (data entry): e.g., bridge, landscape, lighting, utilities
 - Coordinate/assist with developing costs of lump sum items (traffic control, grading complete, C&G, etc.)
- WHY do it? Part of a quality design; allows GDOT to deliver. GOAL = Corrected PFPR cost within 10% of final cost
- WHO does it? (Titles listed may vary by company/organization – the intent is related to level of experience)
 - Engineer - (QC):
 - Develops list of pay items
 - Develops and maintains quantities for items designed in shape files and spreadsheets
 - Inputs pay items and quantities from other offices/disciplines/Subject Matter Experts (SME's)
 - Optional - Engineer not familiar with the project - (QC):
 - Develops independent pay items and quantities for earthwork and pavement (at a minimum)
 - Design Phase Leader (DPL)/Senior Engineer/Supervising Engineer - (QC)
 - Reviews/confirms list of pay items
 - Checks quantities line by line on CES against shape files, spreadsheets, Summary of Quantity (SOQ) drawings, etc.
 - Cross checks CES quantities against plans from other offices/disciplines/SME's
 - Leads coordination with Engineering Services (ES) regarding costs of lump sum items
 - Compares overall cost to previous estimate and understands reason for changes
 - Detailed cross check between Summary of Quantities and CES at PFPR, FFPR, Corrected FFPR (18-week), and Final Plans
 - Principal Engineer/Chief Engineer/Project Manager/Senior Engineer - (QA)
 - Detailed check of pavement and earthwork quantities & pay items
 - Reasonableness check of other quantities, check for missing pay items
 - Determine if coordination has occurred on lump sum item costs and SF costs for bridges
 - Detailed cross check between Summary of Quantities and CES at PFPR, FFPR, 18-week, and Final Plans
- WHEN do we do it?
 - Concept Phase / Concept Report:
 - For each alternative, develop pay items & quantities (CES) for items anticipated:
 - \$/SF is acceptable for bridges, Lump Sum is acceptable for lighting, landscaping, walls, drainage, signs, pavement markings, erosion control, etc.
 - Coordinate with ES on lump sum items and unit costs
 - Submit CES as attachment to draft Concept Report for Concept Team Meeting for at least the perceived Preferred Alternative and include support data to show other Alternative cost comparison to the Preferred
 - Submit CES as attachment (Preferred Alternative only) to concept report
 - Submit CES to PM after Concept Report Approval (processed as an official update)
 - Preliminary Phase / PFPR:
 - Recheck pay items and update quantity shape files and spreadsheets

- Submit Summary of Quantities (SOQ) drawings & CES with PFPR package (CES for review only)
- After PFPR: Update CES to incorporate PFPR responses, submit to PM (as an official update) near time of PFPR responses
- Final Design:
 - FFPR – Recheck pay items and update quantity shape files and spreadsheets; submit SOQ & CES with package
 - Corrected FFPR (18-week) – update SOQ & CES pay items/quantities based on FFPR report; submit SOQ and CES with package
 - Create CES file copy for possible future use. Turn over control of one CES file to ES
 - Final Plans – update SOQ & CES pay items/quantities (CES updates requested by email to ES/CBA)
 - Update CES file copy for possible future use
- Other (Policy 3A-9, update when cost changes by 10% or more; should be “automatic” if we adhere to Policy):
 - Annual Updates (see Policy 3A-9, deadline is 30 day prior to June 30th, PMs typically request in September)
 - If milestone update has been submitted within last 12-months, this can be a price update only
 - Soil Survey Received – update for rock, sideslopes, swell, etc., if needed
 - Pavement Design Approval – update pavement/earthwork quantities, if needed
 - Pay Items & Quantities Received from other offices/disciplines/SME’s – Bridge, lighting, landscaping, utility, etc.
 - Design or Scope changes: e.g., overlay/full depth, bridge length/width, lighting, revised concept, Value Engineering Study implementation, etc.
- Process Resources:
 - Policy 3A-9- Cost Estimating: [LINK](#) CES Cost Estimating Flowchart: [LINK](#)

Cost Estimate QC-QA Best Practices: QUANTITY TAKE-OFFS & LUMP SUM COORD. (HOW)

Project File Documentation - The structure below is intended to standardize the location and naming convention of relevant files for developing and maintaining a project cost estimate. For each milestone cost estimate, there should exist a unique Quantity Shapes file (.DGN file) and a unique Quantities Spreadsheet file (Excel file). The DGN Quantity Shapes file should reference the key DGN files (MAIN, DRNG, STE, etc.) at that milestone and should be “frozen” in time to capture that design, utilizing the record plan set files. The Quantities Spreadsheet file should include a legend/data sheet defining the DGN file shapes.

- PI#\PE\Roadway Design\Roadway\Quantities:
 - PI#_Quantity_Shapes_Concept.dgn (reference DGN files in Record Plan Sets, Concept Layout)
 - PI#_Quantities_Concept.xlsx (including legend/data sheet, see SharePoint site for example)
 - PI#_Quantity_Shapes_Preliminary.dgn (reference DGN files in Record Plan Sets, Corrected PFPR)
 - PI#_Quantities_Prelim.xlsx (including legend/data sheet, see SharePoint site for example)
 - PI#_Quantity_Shapes_Final.dgn (reference DGN files in Record Plan Sets, Corrected FFPR)
 - PI#_Quantities_Final.xlsx (including legend/data sheet, see SharePoint site for example)
 - Misc files related to cost estimate – e.g. earthwork summaries, lump sum spreadsheets
- PI#\Record Plan Sets\02 – Concept Report Layout

- DGN files used to create concept layout
- PI#\Record Plan Sets\06 – Corrected PFPR
 - Key DGN reference files – MAIN, DRNG, LIMIT, STE, SIGN, SGNL, etc.
- PI#\Record Plan Sets\10 – Corrected FFPR
 - Key DGN reference files – MAIN, DRNG, LIMIT, STE, SIGN, SGNL, etc.

Lump Sum Cost Coordination – When the unit for a particular pay item is Lump Sum (aka LUMP, LS) the contractor is paid a “set” amount of money for typically larger scale operations. For these items, generating a cost is more complex than doing a single quantity take-off and applying a unit cost. For these items (typically Traffic Control, Clearing and Grubbing, and Grading Complete), coordination with the estimating section of Engineering Services is required. Do not use bid history costs (automatically populated in CES) for lump sum items. Also, do not use bid history cost for In Place Embankment or items requiring a supplemental description.

- Email request to DesignerEstimateQuestions.dot.ga.gov. Provide the following (at each milestone update) to ES:
 - Project layout or plans, Bridge ID number (if applicable)
 - Your own estimate of the lump sum cost, as a starting point for discussions
 - Brief summary of what your estimate is based on
 - Raw Earthwork volumes

Quantity Take-off and Lump Sum Cost Resources:

- How to Guides, Common Errors, Workarounds, Bid Tab Data, etc.: [LINK](#) and select Category: Engineering Services
- Pay Item Index & Item Mean Summary: [LINK](#) and select Resources → Pay Item Index or select → Resources → Item Mean Summary
- Bid Tabulations (BidX) of similar awarded projects: research Traffic Control and Grading Complete costs: [LINK](#)
 - Contractors may “move money” between Traffic Control / Grading Complete. Sum these costs for context.
- Other GDOT Offices:
 - Engineering Services - coordination on lump sum costs. Cost Estimating SME’s, not CES SME’s
 - Construction - coordination on construction durations
 - Bridge Design - coordination on bridge costs (temporary, permanent, and existing bridge removal). For temp. bridge, don’t use a % of perm. bridge.

Cost Estimate QC-QA Best Practices: CES & PAY ITEMS

- CES:
 - For most projects, Bid Item History should be set to “ALL” and “24 MO” for the most recent quarter available
 - ALL_2017Q3_24MO = Example Item Bid History
 - ALL_2017Q3_2YR = Example Cost Group Bid History
 - If there are many items showing up without costs, try using previous quarter’s bid item history
 - Note – Maintenance 3R projects are examples where we might use “ASPH” instead of “ALL”
 - Spec Year should be set to current edition (13)
 - No costs shall be blank
 - Even dollar or to the tenth of a dollar unit prices typically indicate user inputted value. If needed, these must be manually updated.

- Fill out supplemental information, common examples:
 - Lump Sum Items like Grading Complete, Traffic Control → Project/PI#
 - Sediment Basins, OH signs, etc → Station
 - Bridge and Wall Items → Bridge/Wall Number
- Utilize comment field for notes about items as needed (e.g., date and source of lump sum costs).
- Make sure “Location” data on “General” tab contains the correct County and Rural/Urban designation
- Pay Items:
 - Earthwork (see Policy 2434-1, Method Of Payment For Earthwork):
 - If using Grading Complete (GC), there shall not be an item for Clearing & Grubbing (included in GC)
 - Using GC for EW>100,000 CY requires GDOT Construction Division Director Approval
 - Use of GC does not reduce or simplify our efforts to quantify EW (still have same considerations/calculations)
 - If using Unclassified Excavation/Borrow Excavation, do include Clearing and Grubbing
 - Possible Combinations of Earthwork related pay items:
 - Grading Complete (common) + nothing
 - Unclassified Excavation + Borrow Excavation + Clearing and Grubbing (common)
 - In Place Embankment + Clearing and Grubbing (less common)
 - Earthwork by stage must be considered for all projects, regardless of method of payment
 - Commonly missed (expensive) items:
 - Shoring – separate pay item or ensure it is noted as being covered in Grading Complete or other contract items
 - Rock Excavation/Rock Embankment/Granular Embankment – review/understand soil survey requirements, or assume based on field visit
 - Temporary Barrier/Concrete Barrier – Temporary for staging and Concrete used at the front face of some walls
 - Misc Lump Sum Pay Item considerations:
 - Clearing and Grubbing cost is heavily dependent on pavement retention. If pavement design changes (full depth vs. overlay), update Clearing and Grubbing cost (coordinate with ES)
 - Environment matters – e.g., for the same project, Clearing and Grubbing / Traffic Control could be 3-5 times more expensive in an urban environment than in a rural environment.
 - Lump Sum bridge items – Removal of Existing Bridge, Detour Bridge, and Construction of Bridge Complete – Lump Sum prices vary based on complexity, type, and size.
 - Information taken from Bridge Plans:

Pay Item Number	Quantity	Unit	Pay Item
500-1006	LUMP	LS	SUPERSTR CONCRETE, CL AA, BR NO – 1 (405)
511-3000	LUMP	LS	SUPERSTR REINF STEEL, BR NO – 1 (122011)

Entered into CES:

Pay Item Number	Quantity	Unit	Pay Item
500-1006	405	LS	SUPERSTR CONCRETE, CL AA, BR NO – 1 (405)
511-3000	122011	LS	SUPERSTR REINF STEEL, BR NO – 1 (122011)

- CES & Pay Item Resources:
 - Policy 2434-1- Method of Payment For Earthwork: [LINK](#)
 - Standard Specifications and Supplemental Specifications Books: [LINK](#)
 - How to Guides, Common Errors, Workarounds, Bid Tab Data, etc.: [LINK](#) and select Category: Engineering Services