

# Estimating Procedures

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## 1.0 ESTIMATING

### 1.1 PURPOSE

This procedure is designed to provide guidance to in-house staff and to consultants regarding the background, procedures, data sources, and required forms for the preparation of construction cost estimates.

### 1.2 INTRODUCTION

#### 1.2.1 DEPARTMENT POLICY

It is the general policy of the Engineering Department (ED) to have the engineers, architects, and/or design consultants prepare cost estimates for the work they have designed for all project stages. This includes all estimates prior to construction contract award, which involves the tasks of estimation of material and labor quantities, checking of quantity take-offs, determination of pricing, and computation of cost estimates. Design changes directed after contract award require quantity take-offs only with pricing applied by the Construction Management Division (CMD).

Near the completion of each design stage a summary cost estimate is prepared and a total estimated price is calculated. This total estimated price is called the "Engineer's Estimate (EE)" and represents the ED estimated cost of the project at that particular point in time. All such estimates must be approved by the Chief Estimator except Stage IV estimates below \$100,000.

All Port Authority of New York & New Jersey estimates, whether prepared by in-house staff or by outside consultants, are to be treated as confidential information and the distribution of the Engineer's Estimate or disclosure of any information contained therein must be limited to those personnel who have a legitimate need to know. In addition, all estimators must use the forms attached to this procedure, which can also be found on the ED website, Engineering OnLine (EOL). The Engineering Cost Management (ECM) Estimating Unit is responsible for maintaining the standard estimating forms and their placement on EOL. These forms must also be given to outside consultants for their use in preparing Port Authority of New York & New Jersey estimates

#### 1.2.2 CENTRAL REPOSITORY OF ESTIMATES

The ECM Estimating Unit is responsible for maintaining a central repository of all Engineer's Estimates. The entire Engineer's Estimate with details is sent for scanning by the ECM estimator for inclusion in the Electronic Document Center (EDoC). The Engineer's Estimate summary sheet is also entered into the Engineering Estimating System (EES) estimate database for search and retrieval.

#### 1.2.3 PURPOSE OF PRE-AWARD ESTIMATES

Pre-award construction cost estimates are prepared by designers or consultants and are finalized near the end of each design stage as a project progresses from design concept through completion of pre-bid contract documents.

Pre-award estimates should reflect the fair and reasonable cost that a general contractor may bid to execute the construction requirements, based upon the information shown on the available plans and specifications, assumptions for work required but not yet detailed, and the prevailing or anticipated market conditions. Such pre-award estimates are utilized to:

- Determine initial project feasibility and develop budgets for proposed construction projects.
- Serve as support in the project authorization process.
- Confirm that the established budget for an active project remains an attainable goal.

- Reflect and document the impact of incorporating changes or alternatives in the design/scope.
- Serve as a yardstick to evaluate the reasonableness and responsiveness of the low bid, but not to guess what the lowest bid will be or to put a value on the advantage that an incumbent or otherwise advantageously positioned single contractor may enjoy.

#### 1.2.4 PURPOSE OF POST AWARD ESTIMATES

Post-award estimates are prepared in order to:

- Provide the Resident Engineer (RE) and the Project Manager (PM) with an accurate, detailed listing of the resources and materials, and the expected cost of a post-award contract change.
- Establish the Engineer's Estimate of the cost of a field change or claim.
- Serve as a yardstick in order to help evaluate and negotiate the contractor's change proposal.

#### 1.2.5 GENERAL DEPARTMENT STAFF RESPONSIBILITIES

##### 1.2.5.1 IN-HOUSE STAFF RESPONSIBILITIES

Lead Engineer/Architect (LE/A) coordinates the preparation of the various Design Division (DD) discipline estimates and is responsible to ensure that estimates prepared by DD Task Leaders (TLs) and/or consultants are summarized at each stage of design development and reviewed by the ECM estimator.

PMs assist the ECM estimator by contributing information to the development of general conditions, contingency, net cost work, and extra work to be added to the estimate summary sheet. The PM will have the opportunity to sign the estimate as concurring. The Present & Planned Workload (P&PW) report will have a field for the Project Management Office to use for an estimate that may differ from the official Engineer's Estimate. The Chief Estimator or designee has the overall responsibility to approve the cost estimates at each stage of design, including the final pre-bid Engineer's Estimate.

The RE office will typically prepare the Engineer's Estimate for any post-award contract changes.

ECM estimators support the discipline LE/A, TLs, PMs, and REs with estimating services and cost estimating information. The DD staff and estimators may also be asked to prepare Order of Magnitude estimates for Line Department construction projects. ECM estimators conduct a final review of estimates prepared at each stage of design, whether prepared by the in-house staff or consultants, and establish the "recommended" total Engineer's Estimate. This review covers reasonableness of pricing and completeness, adherence to estimating guidelines, estimating of general conditions and other indirect costs, and summarizing the estimate. ECM estimators are also responsible for the preparation of the Analysis of Bid worksheet, which is used to produce the Analysis of Bid page included in the contract book.

More specific examination of the detailed roles and responsibilities of departmental staff in the preparation, review, and approval of each of the different types of estimates are presented in [Tables 1-B, 1-C, 1-D, and 1-E](#).

##### 1.2.5.2 USE OF OUTSIDE CONSULTANTS TO PREPARE ESTIMATES

Outside consultants are typically used to prepare estimates in the following two instances:

- A. Whenever an ED division retains an outside architectural and engineering (A-E) consultant to design a project, the contract typically includes the requirement to prepare cost estimates.
- B. For large priority projects or other complex projects where special estimating expertise or a second opinion is required, the PM may request the services of the ECM "call-in" consultant to prepare an independent estimate.

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In the latter instance, the responsible PM or RE must ensure that the estimating consultant has at its disposal all the necessary plans, specifications, design basis/criteria, schedule, staging, and other information, necessary to prepare an “independent” estimate.

Outside A-E consultants are required to perform all quantity take-offs and pricing and prepare all estimate worksheets, general condition estimates, and estimate summaries in accordance with the standards, format, and detail enumerated within this procedure, subject to the discretion of the responsible PM or RE.

### 1.3 PROCEDURE C-3 CONSTRUCTION COST ESTIMATES

#### 1.3.1 STAGES OF PROJECT DEVELOPMENT AND CORRESPONDING TYPES OF CONSTRUCTION ESTIMATES

[Table 1-A](#) summarizes the project development stages and the corresponding cost estimates, which are described in greater detail later in this procedure.

At the direction of the Chief Engineer, all estimates must be signed off by the Chief estimator prior to being submit to the line department.

**TABLE 1-A  
TYPE OF CONSTRUCTION COST ESTIMATES**

Estimate Name	General Purpose	% Design Complete	Estimate Basis	Contingency (approx.)	Field Investigation
Order of Magnitude (Stage 0)	Budget or “ball park” figure for planning purposes	No design or limited	Historical or parametric data Include narrative or list of assumptions	25% - 40%	Minimum except when interfacing with existing facilities and utilities
Conceptual Development (Stage 1)	Alternative comparison and Board Authorization for project development	10 - 20% Rough Conceptual designs to identify alternatives	Square foot cost and/or parameters Take-offs of majority elements Include narrative or list of assumptions	15% - 25%	Some field visits for site conditions and minimum quantity survey
Preliminary Design (Stage 2) *	Board authorization for project implementation	Up to 50% Development of major elements	Per unit of design elements Material quotations	10% - 20%	Additional field data feedback
Final Design (Stage 3)	Final pre-bid estimate (including general conditions, market, and bid analysis)	100% Detailed Design	Detailed quantity take-offs Material quotations	None except in limited circumstances	All field conditions identified and considered
Post-Award (Stage 4)	Design changes, field changes, and claims	Detailed design	Detailed quantity take-offs and field reports	None	All field conditions identified and considered

\* Some projects eliminate Stage 2.

### 1.3.1.1 ORDER-OF-MAGNITUDE ESTIMATE (STAGE 0)

The Port Authority of New York & New Jersey Line Departments are responsible for identifying and determining scope, objectives, and schedules of projects to be included into the Port Authority of New York & New Jersey capital and operating plans. Prior to Stage 1 commencement of a project, the LE/A is responsible for providing Order of Magnitude estimates of the cost of planned projects to help the Line Departments determine each project's feasibility and to establish the initial project budget.

Order of Magnitude cost estimates typically contain contingency allowances ranging from 25% to 40% above the total calculated cost of construction based on the complexity of the project.

### 1.3.1.2 CONCEPTUAL DEVELOPMENT ESTIMATE (STAGE 1)

A Stage 1 construction cost estimate is used to compare alternatives and develop a concept sufficiently for authorization to go further.

During Stage 1, sketches and more refined scope parameters may be used by design team to establish quantities. Until such refinements are available, these estimates will be calculated in much the same fashion as Order of Magnitude estimates.

For all the required work that has not been depicted in the conceptual plans and specifications, reasonable cost allowances may be included for such items in anticipation of further design development. However, the basis for such allowances should be documented, and unidentified lump sum allowances should be avoided. The confidence level of Stage 1 estimates is higher than that of the Order of Magnitude estimates, thus the contingency allowance is reduced to 15% to 25% above the total calculated cost depending upon the complexity of the project.

See [Figure 1-A](#) for the all stages cost estimate form.

### 1.3.1.3 PRELIMINARY DESIGN ESTIMATE (STAGE 2)

Stage 2 generally represents the midpoint of design. The geometry will have been firmed-up and most of the project's systems will have been selected. For architectural projects the site situation, building materials, typical construction sections, roof drainage, interior finishes, floor plan, equipment locations, and supporting mechanical, electrical and fire protection systems are defined. For engineering projects, the load calculations, choices of basic equipment (sizes and types), and design layouts are defined. Much of the critical construction phasing and sequencing is known.

Preliminary drawings and specifications have been prepared and the designers' assumptions listed for less defined areas, so as to provide enough detail to establish many of the exact quantities of required construction materials. The need for design contingencies will have diminished and the contingency allowance can therefore be reduced to 10% to 20% depending upon the complexity of the project.

See [Figure 1-A](#) for the all stages cost estimate form.

### 1.3.1.4 FINAL DESIGN ESTIMATE (STAGE 3)

The preliminary Stage 3 cost estimate is prepared after the contract drawings have been completed. The estimate will reflect the cost of all elements of work, which will have been clearly shown, and all special conditions pertaining to the site that have been clearly defined in the specifications.

There should be no need to include any cost allowance for unknown items, design refinements, or contingencies. However, any items of work discovered to be inadequately defined by the final plans and specifications should be flagged during the Preliminary Stage III estimate, so that they may be revised or clarified.



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The Stage 3 estimate should include a detailed breakdown of all direct costs and all indirect costs (which include field overhead [also known as general conditions], home office overhead, and profit), as more fully detailed in subsequent respective sections.

Stage 3 estimates should normally break down each direct cost work item in terms of labor and material. Although the Port Authority of New York & New Jersey policy is to encourage lump sum contract awards, the use of lump sum items without details of labor and material in the Stage III cost estimate is discouraged when it is possible to describe and quantify work items. The use of vendor quotations for specialty items is an exception to this general guideline.

A Stage 3 estimate is signed off by the Chief Estimator, LE/A, and Estimator or designee at the time of the signing of the contract drawings. Any updates of the estimate must also be signed by the Chief Estimator, including any final update. At that time, all the addenda will have been issued and their effect on a contract's cost can be evaluated. A final assessment of the bidding climate will be made at that time.

See [Figure 1-A](#) for the all stages cost estimate form.

**1.3.1.5 USE OF UNIT PRICE OR CLASSIFIED ITEMS**

Refer to the guidelines of Contracts Department.

**1.3.1.5.1 General Conditions Cost Estimate (Part of Stage 3 Estimate)**

The general conditions cost estimate is prepared as part of the Stage cost estimate and is included within the estimate to more accurately represent the total cost of the project. The ECM estimator and LE/A will typically prepare the general conditions cost estimate and/or provide assistance to the PM in compiling the general conditions summary sheet.

**1.3.1.5.2 Analysis of Bid Worksheet (Part of Stage 3 Estimate process)**

The Analysis of Bid worksheet ([Figure 1-B](#)) is prepared upon completion of the Stage 3 cost estimate, prior to final preparation of the contract book. It provides a summary of the major construction components of the contract. It is prepared by the ECM estimator. It is then given to the LE/A who submits it to the contracts specification writer to be incorporated into the contract book before the bid documents are printed.

ANALYSIS OF BID					
					
PROJECT			BID DATE		
			SHEET		
<i>THIS IS NOT PART OF THE CONTRACT</i>					
CONTRACTOR			CONTRACT NO.		
Unit No.	Descriptions <sup>1</sup>	Quantity	Unit <sup>2</sup>	Unit Price	Amount
1					
2					
3					
4					
5					
6					
7					
8					
9					
<b>Total Construction Cost</b>			<b>LS</b>		
1. Separate and list all items or operations of work included in your estimate in accordance with Specifications. When listing subcontracts, the prime contractor will have each subcontractor complete an analysis of bid form.					
2. Unit of measure, i.e., SF, CY, Bbls, Pcs, Ea., etc.					
3. Include all charges, such as moving on site, removal, rental, etc.					
4. In case of conflict between information hereon (whether supplied by the Authority or the bidder) and the terms or prices contained or inserted in the Contract Booklet or Contract Drawings, said Booklet and Drawings shall control.					
5. The Analysis of Bid is not part of the contract. No information hereon (whether supplied by the Authority or the bidder) and no information deduced from information hereon, including quantities of materials or work, shall be deemed to vary, alter or modify any provision of the Contract, including provisions therein as to compensation and performance. The unit prices contained hereon serve the sole purpose of informing Port Authority as to components of the bidder's price quoted in the Contract. The items of materials or work contained hereon shall not be deemed to be an exhaustive list of the items of materials or work required by the Contract Drawings and Specifications in their present form.					

Page 1

Figure 1-B Analysis of Bid

The bidders are asked to show on that form the breakdowns of their lump sum bid item pricing for the specific contract work. The Analysis of Bid is a non-binding tabulation of prices for the items listed and is not considered to be part of the contract. After the receipt of bids, the Analysis of Bid form submitted by the bidder is used to help examine possible areas of divergence between the Engineer's Estimate and the other bidders.

#### 1.3.1.6 POST AWARD ESTIMATE (STAGE 4)

The Stage 4 construction cost estimates are prepared for Post Award Contract Changes (PACCs) and supplemental work in order to establish the Engineer's Estimate for modifications to a contract. Such modifications are typically negotiated with the contractor.

Stage 4 estimates for PACCs that are the result of Line Department-directed design changes or for field changes that require a design change will have a quantity take-off prepared by the DD staff. CMD will price and complete the estimate. The ECM estimator will review all estimates greater than \$100,000.

Stage 4 estimates for those "field initiated" PACCs, which are the result of field conditions and other field-related supplemental work or for contractor claims, are typically prepared by CMD field personnel. Those estimates greater than \$100,000 must also be reviewed and signed off by the ECM estimator.

Stage 4 estimates must be broken down into separate elements for materials and labor and for each item of work for comparison against the contractor's estimate in order to facilitate a negotiated lump sum price for the modification. If a lump sum agreement cannot be reached, the work is performed on a time and materials basis.

The indirect cost mark-ups for subcontractor overhead and profit and for General Contractor (GC) overhead and profit must be added whenever a change produces an addition to the contract cost.

#### 1.3.2 NET COST PROCEDURE

Contracts may contain net cost provisions when it is reasonably certain that specific items of work will be required, but there is no way to sufficiently determine the character or extent of the work until it is actually performed (e.g., rock removal, replacement of unsuitable fill, etc.).

An Order of Magnitude estimate must be prepared for each net cost item. An Order of Magnitude estimate is a "ball park" amount that is used for budgeting purposes and does not require any design. The Order of Magnitude net cost estimate shall be part of the formal Engineer's Estimate and must be included in the Policy MJ briefing folder. The list of Net Cost items must be reviewed with the RE and must be in the contract documents.

The value of the net cost work in relation to the Engineer's Estimate determines whether the net cost work is bid by the contractor (see chart below) or included as "clause work" in the contract documents, in which case it is not bid by the contractor.

Engineer's Estimate	Net Cost Must Be Bid When Net Cost Estimate Is:
\$0 to \$1M	Greater than 50% of the Engineer's Estimate
\$1M to \$5M	\$500K or 25% of the Engineer's Estimate, whichever is greater
\$5M to \$10M	\$1.25M or 15% of the Engineer's Estimate, whichever is greater
\$10M to \$20M	\$1.5M or 10% of the Engineer's Estimate, whichever is greater
\$20M+	\$2M+

#### 1.3.3 ROLES AND RESPONSIBILITIES

[Tables 1-B](#), [1-C](#), [1-D](#), and [1-E](#) depict details of the roles and responsibilities of key staff regarding estimate preparation, review, and approval for each of the five estimate stages.

**TABLE 1-B  
STAGE 0 AND 1 ESTIMATES**

Staff	Role	Description of Responsibility
PM	Support	<ol style="list-style-type: none"> <li>1. Coordinate identification of requirements and major project elements with DD.</li> <li>2. Consult with the LE/A and ECM Estimator on issues and conditions that may affect the estimate.</li> <li>3. Transmit estimate to Line Department and include in P&amp;PW report.</li> </ol>
Chief Estimator	Oversee	<ol style="list-style-type: none"> <li>1. Oversee project scope/cost development and approve estimate.</li> </ol>
DD (each Discipline)	Primary	<ol style="list-style-type: none"> <li>1. LE/A develops conceptual scope documents.</li> <li>2. Prepare conceptual design criteria.</li> <li>3. Organize discipline estimate by WBS element.</li> <li>4. Prepare assumptions as basis of estimate.</li> <li>5. Develop parametric or other means to estimate quantities.</li> <li>6. Compute separate discipline estimates.</li> <li>7. Summarize costs to WBS elements.</li> <li>8. LE/A evaluates individual discipline estimates for conformance to project scope.</li> </ol>
ECM (Estimators)	Support	<ol style="list-style-type: none"> <li>1. Maintain historical and subscription cost data and prior estimate data.</li> <li>2. Review all discipline and summary estimates or assist in preparation of Order of Magnitude estimates and summaries.</li> <li>3. Scan all approved estimates for upload to EOL and Livelink.</li> <li>4. Enter estimate summary information into the EES estimate database.</li> <li>5. Check individual estimates for missing or overlapping of items.</li> </ol>
CMD (RE)	Support	<ol style="list-style-type: none"> <li>1. Feasibility, fatal flaw check, if requested.</li> <li>2. Review completed estimate, if requested.</li> <li>3. Provide input regarding constructability and staging.</li> </ol>

**TABLE 1-C  
STAGE 2 ESTIMATES**

Staff	Role	Description of Responsibility
PM	Support	<ol style="list-style-type: none"> <li>1. Coordinate updating user requirements and project elements w ith DD.</li> <li>2. Consult w ith the LE/A and ECM Estimator on issues and conditions that may affect the estimate.</li> <li>3. Transmit estimate to Line Department and include in P&amp;PW report.</li> </ol>
Chief Estimator	Oversee	<ol style="list-style-type: none"> <li>1. Oversee project scope/cost development and approve estimate.</li> </ol>
DD (each Discipline)	Primary	<ol style="list-style-type: none"> <li>1. LE/A develops preliminary scope documents.</li> <li>2. Prepare preliminary design criteria.</li> <li>3. Organize discipline estimate by WBS element.</li> <li>4. Update assumptions as basis of estimate.</li> <li>5. Develop preliminary quantities w ithin discipline.</li> <li>6. Assemble information regarding specialty vendors.</li> <li>7. Establish proposed combined unit prices.</li> <li>8. Compile separate discipline estimates.</li> <li>9. Summarize costs to WBS elements.</li> </ol>
ECM (Estimators)	Support	<ol style="list-style-type: none"> <li>1. Maintain historical and subscription cost data and prior estimate data.</li> <li>2. Review all discipline and summary estimates.</li> <li>3. Assist LE/A w ith summary estimate.</li> <li>4. Participate in “independent” estimate preparation and reconciliation as needed.</li> <li>5. Scan all approved estimates for upload to EOL and Livelink.</li> <li>6. Enter estimate summary information into the EES estimate database.</li> </ol>
CMD (RE)	Support	<ol style="list-style-type: none"> <li>1. Feasibility, fatal flaw check, if requested.</li> <li>2. Review completed estimate, if requested.</li> <li>3. Provide input regarding constructability and staging.</li> </ol>

**TABLE 1-D  
STAGE 3 ESTIMATES**

Staff	Role	Description of Responsibility
PM	Support	<ol style="list-style-type: none"> <li>1. Coordinate final user requirements and project elements with DD.</li> <li>2. Consult with the LE/A and ECM Estimator on issues and conditions that may affect the estimate.</li> <li>3. Transmit estimate to Line Department and include in P&amp;PW.</li> </ol>
Chief Estimator	Oversee	<ol style="list-style-type: none"> <li>1. Oversee project scope/cost development and approve final estimate.</li> </ol>
DD (each Discipline)	Primary	<ol style="list-style-type: none"> <li>1. LE/A develops final scope documents.</li> <li>2. Prepare final design criteria.</li> <li>3. Organize discipline estimate by WBS element.</li> <li>4. Update assumptions as basis of estimate.</li> <li>5. Develop final quantities within discipline.</li> <li>6. Assemble information regarding specialty vendors.</li> <li>7. Establish proposed labor/material pricing.</li> <li>8. Apply element and CSI cost codes to estimate as described in the Estimating Guidelines.</li> <li>9. Compute separate discipline estimates.</li> <li>10. Summarize costs to WBS elements.</li> <li>11. LE/A attends pre-bid meeting if requested by ECM.</li> </ol>
ECM (Estimators)	Support	<ol style="list-style-type: none"> <li>1. Maintain historical and subscription cost data and prior estimate data.</li> <li>2. Review all discipline and summary estimates.</li> <li>3. Assist LE/A with summary estimate.</li> <li>4. Participate in "independent" estimate preparation and reconciliation as needed.</li> <li>5. Prepare Analysis of Bid form.</li> <li>6. Conduct pre-bid meeting to finalize Engineer's Estimate.</li> <li>7. Scan approved estimates for upload to EOL and Livelink.</li> <li>8. Enter estimate summary information into the EES estimate database.</li> </ol>
CMD (RE)	Support	<ol style="list-style-type: none"> <li>1. Provide input regarding constructability and staging.</li> <li>2. Review all completed estimates.</li> <li>3. Attend pre-bid meeting if requested by ECM.</li> </ol>

**TABLE 1-E  
STAGE 4 ESTIMATES**

Staff	Role	Description of Responsibility
PM	Support	<ol style="list-style-type: none"> <li>1. Coordinate requirements with DD regarding Line Department and Design changes (L&amp;D).</li> <li>2. Review estimate summary (for major L&amp;D changes only) and transmit to Line Department.</li> </ol>
Chief Estimator	Oversee	<ol style="list-style-type: none"> <li>1. Approve estimate.</li> </ol>
DD (each Discipline)	Primary	<ol style="list-style-type: none"> <li>1. LE/A develops scope documents (for L&amp;D changes).</li> <li>2. Develop take-off quantities within discipline and provide take-off details to CMD.</li> </ol>
ECM (Estimators)	Support	<ol style="list-style-type: none"> <li>1. Maintain historical and subscription cost data and prior estimate data.</li> <li>2. Review all design-related estimates and all estimates greater than \$100,000.</li> <li>3. Scan selected approved estimates for upload to EOL and Livelink.</li> <li>4. Enter estimate summary information into the estimate database.</li> <li>5. Provide QA-QC review of estimates.</li> </ol>
CMD (RE)	Primary	<ol style="list-style-type: none"> <li>1. Review scope of change.</li> <li>2. Prepare Engineer's Estimate (for L&amp;D changes) and review DD take-offs.</li> <li>3. Analyze schedule impacts as required.</li> <li>4. Prepare independent take-offs, pricing, and compute estimate (for field changes).</li> <li>5. Apply pricing to DD take-offs for all L&amp;D changes.</li> <li>6. Review estimates greater than \$100,000 with ECM.</li> <li>7. Negotiate with contractor.</li> <li>8. Prepare information for contract modification/supplement.</li> <li>9. Provide additional information to estimators as requested.</li> </ol>
Contractor	Primary	<ol style="list-style-type: none"> <li>1. Review owner-directed change (L&amp;D) or field change.</li> <li>2. Prepare estimate of cost and schedule impact (proposal).</li> <li>3. Review and negotiate with CMD.</li> </ol>

## 1.4 ANALYSIS OF BID

### 1.4.1 PURPOSE

The ECM Estimator shall prepare the Analysis of Bid form for inclusion in the Contract Book by the Contract Engineer. Upon receipt of bids, the PM and ECM Estimator shall analyze and compare the low bid to the Engineer's Estimate and other bidders. This will aid in determining whether a low bid meeting or Technical Qualification Hearing (TQH) will be required. The comparison will determine whether the lowest qualified bid is fair and reasonable and whether the contract should be awarded.

### 1.4.2 REQUIREMENTS

- A. The ECM Estimator shall evaluate and develop a composite list of major scope items and review it with the LE/A. The ECM Cost Estimator shall prepare the Analysis of Bid form with assistance from the RE as required.
- B. The ECM Estimator shall transmit the completed Analysis of Bid form to the Contract Engineer and LE/A for review and inclusion in the Contract Book.
- C. Upon receipt of bids, the Cost Estimator shall prepare a spreadsheet of the Engineer's Estimate (EE) and bid array for review by the PM and the LE/A. Comparison can be used to determine if a low bid meeting or TQH is required or if Recommendation to Award can proceed.
- D. In general, if the low bid is more than 10% higher or lower than the EE, a low bid meeting should be held to ensure that the low bidder understands and has included all work required by the contract and/or to justify the difference in bid price to the EE.
- E. Prior to the low bid meeting or TQH, the ECM Estimator should prepare a side-by-side comparison of major cost items of the EE and low bidder's Analysis of Bid ([Figure 1-C](#)). Significant differences should be highlighted.
- F. If the bid results do not conform with the ECM estimating performance metric, a Bid Variance White Paper should be prepared indicating the reason for the difference and justification for recommending award or rejecting bids ([Figure 1-D](#) and [Figure 1-E](#)).
- G. If high bid price cannot be justified, consideration should be given to rejecting bids.

THE PORT AUTHORITY OF NY & NJ															
CONTRACT : EWR-934.270 Priority Crash Location Safety Improvements- Upgrade of Guide Signs															
ANALYSIS OF BID -- BIDS COMPARISON															
Project Manager / LEA: xxx / xxx															
Charge Code : xxxxxx															
Bid Date : xxxx															
Proc. Method : MWBE															
No. of Bids : 2															
Prepared by : xx															
Engineer's Estimate					(1) YYY				Deviation (Low Bid - EE / EE)			(2) ZZZ			
Item No.	Description	Quantity	Unit	Unit Price	Amount (\$)	Quantity	Unit	Unit Price	Amount (\$)	Amount (\$)	%	Quantity	Unit	Unit Price	Amount (\$)
<b>UNCLASSIFIED WORK</b>															
1	General Conditions	1	LS	48,260	48,260	1	LS	50,000	50,000	1,740	3.6%	1	LS	96,060	96,060
2	MDT	1	LS	36,750	36,750	1	LS	100,000	100,000	63,250	172.1%	1	LS	120,000	120,000
3	Permanent Signs on Overhead Structure (incl. removals):	-		-	-	-		-	-	-		-		-	-
4	Sign 26A	288	SF	122	35,133	288	SF	97	27,936	(7,197)	-20.5%	288	SF	110	31,680
5	Sign 27B	288	SF	122	35,133	288	SF	97	27,936	(7,197)	-20.5%	288	SF	110	31,680
6	Sign 29A	546	SF	122	66,606	546	SF	105	57,330	(9,276)	-13.9%	546	SF	110	60,060
7	Sign 30A	240	SF	122	29,277	240	SF	95	22,800	(6,477)	-22.1%	240	SF	110	26,400
8	Sign 30B	240	SF	122	29,277	240	SF	95	22,800	(6,477)	-22.1%	240	SF	110	26,400
9	Sign 31A	546	SF	122	66,606	546	SF	105	57,330	(9,276)	-13.9%	240	SF	110	26,400
10	Sign 32A	240	SF	122	29,277	240	SF	95	22,800	(6,477)	-22.1%	240	SF	110	26,400
11	Sign 32B	240	SF	122	29,277	240	SF	95	22,800	(6,477)	-22.1%	240	SF	110	26,400
12	Sign 33A	507	SF	122	61,848	546	SF	105	57,330	(4,518)	-7.3%	546	SF	110	60,060
13	Sign 45A	240	SF	122	29,277	240	SF	95	22,800	(6,477)	-22.1%	240	SF	110	26,400
14	Sign 45B	240	SF	122	29,277	240	SF	95	22,800	(6,477)	-22.1%	240	SF	110	26,400
<b>Total Lump Sum</b>					<b>526,000</b>			<b>514,750</b>	<b>(11,250)</b>	<b>-2.1%</b>				<b>618,000</b>	

Figure 1-C Bid vs. EE Comparison

# Sample

**(High Bids)  
Contract JFK-834.103  
JFK – Rental Car Site  
Federal Circle Station AirTrain Canopies**

**Bid Variance White paper**

Engineer's Estimate: \$1,700,000  
Low Bid: \$2,216,000  
Bid Variance: \$ 516,000

The Engineer's Estimate indicated on the attached bid tab was mistakenly shown as \$1.7 million – it should have been shown as \$1.8 million per signed Estimate.

Upon review of our estimate, it was determined that the consultant's estimated cost for the Architectural Steel Fence was underestimated based upon comparison with our prior experience with this type of fence. Discussions with a fence fabricator also confirmed that the consultant's unit price for the fence was too low. The estimate for the fence should have been about \$200,000 higher.

The Engineer's Estimate should, therefore, have been approximately \$2 million. This results in the low bid being about 11% above the Engineer's Estimate.

The top three bidders were within 3% of each other.

In light of the above, I plan on recommending award of the contract pending line department concurrence.

**Figure 1-D Bid Variance White Paper – High Bid**

# Sample

(Low Bids)

Contract BJ-375  
Upper Buss Level  
Bearing Plate Replacement  
Bid Variance White Paper

Engineer's Estimate:	\$183,000
Low Bid:	\$95,700
Bid Variance:	\$65,300

Although the subject contract was bid via a Select List, a low bid meeting was held with the low bidder (NAB) to insure that they understood all of the contract requirements.

A major portion (\$60,000) of the difference between NAB's bid and the Engineer's Estimate is related to the jacking of existing beams needed to perform the required repairs. NAB indicated that they have reviewed their estimate and are confident that they can do the work at their bid price. In particular, NAB feels that their plan to reuse the temporary steel beams for the jacking operation will reduce their costs. They also feel that since they have done this type of work in the past, (at the Tappan Zee Bridge), they can do it very efficiently with their own forces.

Based upon a discussion of the details of the jacking operation, it appears that NAB is aware of all of the contract requirements.

A smaller portion of the difference, about \$15,000, is due to the fact that NAB thought that the removal of existing fireproofing (non-asbestos) was net cost in all areas rather than just at one location. Since some of the existing fireproofing is already missing or loose, NAB feels that this may not be a significant problem.

In light of NAB's good performance in the past, their previous experience on similar type of work and their confidence in their estimate, I will be recommending award to NAB.

**Figure 1-E Bid Variance White Paper – Low Bid**