

Estimating Manual



October 2010

Preface

Summary of Revisions

Items added to this document and not included in the October 2010 Estimating Manual include:

- ✓ Information on the [Distribution and Review of Estimates](#) in the Regions. This discusses how estimates from Scoping through PS&E are to be distributed.
- ✓ Information on the [Distribution of the Final Engineer's Estimate](#) specifically.
- ✓ [ODOT Policy and Procedure](#) regarding the Security/Confidentiality of the Final Engineer's Estimate.
- ✓ A comprehensive breakdown of *Estimator* [Group Numbers](#).
- ✓ [Appendix E](#) includes a memo which outlines ODOT's policy for the management of the Engineer's Estimate.

If more information is needed on these topics, or topics not covered in this manual, please contact the Office of Project Letting.

Table of Contents

Preface.....	II
Summary of Revisions.....	II
Purpose of Manual.....	1
Training Information.....	2
Training Classes.....	2
Definitions.....	3
Estimating Methods.....	4
Project Items.....	6
Biddable vs. Non-Biddable.....	6
Bid Item.....	6
Lump Sum Items.....	6
Percentages for Lump Sum Items.....	7
Hybrid Lump Sum Items.....	8
Anticipated Items.....	8
Incidental Items.....	9
Entering Incidental and Breakdown Data.....	10
Overview of <i>Trns•port</i>	11
Flowchart of the <i>Trns•port</i> System.....	12
Description of Different <i>Trns•port</i> Modules.....	13
<i>Trns•port</i> Estimator.....	17
Catalog.....	17
Skeleton File.....	18
Importing a File to <i>Trns•port Estimator</i>	18
Mandatory Parameters.....	18
Initial Estimate Page.....	18
Description of All Fields on Estimate Page 1.....	19
Description of All fields on Estimate Page 2.....	20
Notes Tab in Estimate File.....	21
Ways to Create an Estimate in Estimator.....	21
Building an Estimate From Scratch.....	21
Copying an Estimate from a Template.....	22
Groups.....	23
Group Numbers.....	23
Adding a Group.....	23
Adding a Group Header.....	23
Bid Items.....	24
Adding an Item.....	24
Supplemental Descriptions.....	24
Adding Unit Prices.....	24
Breakdown of the Item Number.....	24
9Z9 Items.....	25

Saving Estimates	25
Settings for Where Files are Saved.....	25
How to Save a Completed Estimate File.....	26
System Does Not Update for Inflation.....	26
Additional Information to Remember.....	27
Escalators	28
Fuel Escalation	28
Asphalt Escalation	28
Steel Escalation.....	28
Contingency Percentage.....	29
Fixed Contingency	29
Variable Contingency.....	29
Common Mistakes.....	30
Common Mistakes When Completing an Estimate.....	30
Distribution and Review of Estimates	32
Distribution of Estimates	32
Scoping through DAP Estimates:.....	32
Preliminary, Advanced, Final, and PS&E estimates:.....	32
Distribution of the Final Engineer’s Estimate	33
Review of Estimates	33
The Role of the Office of Project Letting.....	35
Final Engineer’s Estimate.....	36
Security/Confidentiality of the Final Engineer’s Estimate	37
ODOT Policy and Procedure	37
Unbalanced Bids	40
Mathematically and Materially Unbalanced Bids	40
Quality Control	41
Construction Schedules	42
Appendices	44
Appendix A	45
Appendix B	46
Appendix C	47
Appendix D	48
Appendix E	49

Purpose of Manual

The purpose of the Oregon Department of Transportation Estimating Manual is to provide a resource for understanding ODOT's construction estimating process. Estimates are developed as early as the scoping phase of a project and are continually revised and updated until the project incurs actual construction costs. This manual addresses construction plan development, which is part of the advanced plans phase, and beyond. This manual will help give an understanding of the estimating process, the Final Engineer's Estimate and an overview of the *Trns•port* system. An in depth section about the *Trns•port Estimator* module is included as well. Future revisions of this manual will expand to include earlier estimating techniques and practices.

Estimates must follow the latest version of the standard specifications for construction, which is currently the 2008 edition of the [Oregon Standard Specifications](#). This latest version can be found on the ODOT Specifications website.

Each project is unique. To accurately develop an estimate of the construction costs for a project, an estimator must be capable of mentally constructing the project and then accounting for all the activities necessary to complete it. Many of the best cost Estimators are knowledgeable in both transportation design and construction.

While estimating a project, Estimators should be shielded from pressures to keep estimates within programmed or desired amounts based on available funding. Estimators should be free to establish what they consider to be a fair and reasonable estimate based on the scope and schedule of the project and anticipated bidding conditions (i.e. local and global market conditions).

Training Information

Training Classes

Users of *Trns•port Estimator* must receive training before ODOT will grant permission to use the *Trns•port Estimator* software. In addition, Consultants and Local Agencies must have ODOT User ID's. Participants taking these classes should be using *Trns•port Estimator* for their jobs in scoping, PS&E, cost of components, and budgeting. ODOT training is available to Local Agency staff, Consultants, and ODOT employees.

There are four classes that look at different aspects of *Trns•port Estimator* and how it can be used for scoping, PS&E, costing of components, and budgeting. There are typically two classes a week, every other week throughout the year. These classes are centered on the needs of the participants in each class relating to *Trns•port Estimator*.

For more information or to sign up for a class contact [ODOT Roadway Engineering](#) at 503-986-3714.

Definitions

American Association of State Highway Transportation Officials (AASHTO) – AASHTO provides technical services and transportation related policies to support states in their efforts to efficiently and safely move people and goods.

Cost – Cost is an expense paid out. It implies an expense was actually incurred.

Final Engineer’s Estimate (FEE) – The Final Engineer’s Estimate is the final estimate used for bid opening, evaluation, recommendation, and contract award. The FEE includes addenda between PS&E submittal and bid opening.

Federal Highway Administration (FHWA) – FHWA is part of the U.S. Department of Transportation. FHWA is in charge of ensuring America’s roads and highways continue to be the safest and most technologically up-to-date. FHWA helps states by providing financial and technical support for constructing, improving, and preserving America’s highway system.

Office of Project Letting (OPL) – A unit within ODOT’s Technical Services Branch that includes Pre-Letting, Specifications, Estimating, and Quality Assurance for Design. OPL provides the professional conduit to assist the project team in successfully delivering a project to bid.

ODOT’s Procurement Office – Construction Section (OPO – Con) – ODOT’s Procurement Office – Construction Contracting Section is within the Support Services Branch and is responsible for the advertising, bid opening, and awarding tasks for highway construction projects for ODOT’s Procurement Office

Price – Price is generally an estimate or quote – a “bid”. It implies that an agreed upon rate of exchange between two parties for services is to be performed.

Plans, Specifications and Estimate (PS&E) – A [scheduled milestone event](#) wherein all elements of a project necessary for ODOT to advertise for bid have been delivered to, and accepted as complete by ODOT’s Office of Project Letting.

PS&E Provider – The organization or business entity providing the complete PS&E package. This may be an ODOT Region, a Local Agency, or a private consulting firm.

Zero Cost Estimate – An estimate showing only bid items and their quantities. No unit prices are included.

Estimating Methods

The critical review of any bid depends on the reliability of the estimate it is being compared to. The Final Engineer's Estimate should reflect the amount the contracting agency considers fair and reasonable, and is willing to pay for performance of the proposed work. Under-estimating causes project delay because additional funding has to be arranged to meet additional costs. Over-estimating causes inefficient use of funds, which could be used for other projects. There are three main methods to create an estimate: Bid Based, Cost Based, and a combination of the two.

- **Bid Based:** This method uses historical data, unit prices, and quantities from recently awarded contracts to form an estimate. This approach is a cost-effective method to develop the final engineer's estimate, but solely relying on historical data may not be appropriate when the data is based on a non-competitive bidding environment. Under this approach, bid data is summarized and adjusted for project conditions (i.e., project location, size, quantities, etc.) and the general market conditions. This method requires the least amount of time and personnel to develop and produce an adequate estimate for use in budgeting/programming, as long as competitive bid prices are used. Non-competitive and unbalanced bidding practices are the least recognizable using this method.
- **Cost Based:** The actual cost method takes into consideration factors related to performance of the work (i.e., the current cost of labor, equipment, materials, sequence of operations, production rates, and a reasonable value of overhead and profit). This method requires the estimator to have a good working knowledge of construction methods and equipment. The estimator should have resources available for determining production rates from actual work performed by the contracting industry on similar types of projects, as well as resources for determining current construction methods and equipment. While adjustments for current market conditions may be required, this method typically produces an accurate estimate and is useful in the bid review process, aiding the decision to award or reject the project. This method is more time consuming and may not be practical for all projects.
- **Combination:** This method combines the use of the Bid Based and Cost Based methods. With this method, ODOT knows the potential bidders, market trends and construction methods. Most projects contain a small number of items that together comprise a significant portion (e.g. 75 percent) of the total cost. These major contract items may include Portland cement concrete pavement, structural concrete, structural steel, asphalt concrete pavement, embankment, or other major items of work within the contract. ODOT collects information related to local market prices of materials from materials and equipment manufacturers,

dealers, and rental companies to obtain current cost information on a regular basis. The remaining items are estimated based on historical prices and adjusted as appropriate for the specific project.

Project Items

Biddable vs. Non-Biddable

Bid items for which work will be paid are considered biddable items. All other items, not in the project bid list, such as contingency, engineering, and anticipated items are non-biddable. Items that are non-biddable are identified (and approved if required) prior to delivering the project to Office of Project-Letting.

Bid Item

The standard specifications and special provisions establish the bid items for which work will be paid. Except for the items identified in the specifications as [incidental](#), all work shown on the plans require bid items. Use bid items from the established [Standard Bid Item List](#). Use of bid items that are not on the established list will require written special provisions, including materials, construction, measurement, and payment.

A bid item is considered to be a specific unit of work for which a price is provided in the contract. Combining two or more existing bid items into one bid item is not recommended. Combining bid items creates a flawed bid history for the particular bid item used and leads to highly inaccurate costs and misinterpretation by contractors.

Lump Sum Items

The use of lump sum items is not recommended. Lump sum items are often used when an item of work can only be defined in general terms. For example, when the finished product can be defined but not all of the components or details can be easily determined, the use of lump sum items is acceptable. This can make estimating lump sum items difficult for the estimator. The more information provided and smaller breakdown of lump sum items an estimator has available, the greater the likelihood an accurate lump sum estimate can be developed. An estimator should define a lump sum item in terms of its simplest, most basic components and should consider other factors that are not easily estimated. By breaking up a lump sum item into smaller items of work which have historical data, and then applying reasonable estimated prices to those sub units, the estimator can accurately establish a price for the overall lump sum item.

Lump sum items are divided into two categories:

- a. Standard Lump Sum Items – Standard lump sum items are identified in the Oregon Standard Specifications and Boiler Plate Special Provisions. Use these standard lump sum items as appropriate according to the Oregon Standard Specifications and Boiler Plate Special Provisions. Examples include mobilization, erosion control, steel plate girder, etc.

- b. New Lump Sum Items – New lump sum items are items not in the Standard Specifications or Boiler Plate Special Provisions. New lump sum items are sometimes included in project specific specifications. The use of new lump sum items is discouraged because of higher costs to the Agency when adjustments must be made to the bid item. FHWA encourages the use of separate, non-lump sum bid items.

Using lump sum items typically transfers risk to a contractor. Contractors may raise prices to take on this risk. Contractors cannot necessarily rely on overruns to cover work they did not foresee. Lump sum items should only be used when the following conditions apply:

- A. The lump sum item is a standard item with no appropriate alternative non-lump sum standard item available for use.
- B. The work is not easily defined. The final product is known but the construction techniques or other components are difficult to determine.
- C. The work is complex with many components (the designer is encouraged to break down lump sum items to their constituent items if possible).
- D. The lump sum payment may be justified as an incentive to complete work in a more timely or efficient manner than if other units of measure were used.

In the *Transport Estimator* module a lump sum item will be shown with an “A” at the end of the [item number](#).

Percentages for Lump Sum Items

The following percentages have been developed to show the typical percentage range for specific items. These percentages should be decided before the project goes into the estimating phase and should be documented in the specifications for each project.

Mobilization –	8.0% - Normal 9.0% - Large earthwork projects. Large amount of equipment needed. 10.0% - Structures
TP&DT –	0.5% - High dollar paving projects, preservation (non-urban) 1.0% - Normal 1.5% - Several areas of work simultaneously where TP&DT (Temporary Protection & Direction of Traffic) is needed simultaneously 6.0%-7.0% - Signals, Camera Installations Original prices generally come from TP&DT designer. If the original price varies significantly from the above percentages then check with the designer for verification.

Erosion Control – 0.2%

Surveying – 1.0% - 1.5%

Removal of Structures & Obstructions – Identify items and cost out as per sheet #2 in the Clearing and Grubbing [worksheet](#)

Clearing and Grubbing – Identify number of Acres and cost out as per sheet #1 in the Clearing and Grubbing [worksheet](#).

Hybrid Lump Sum Items

Hybrid lump sum items are used when lump sum items are specified in the project specifications. Examples of hybrid lump sum items are structural concrete, structural steel, bridge rail, sign supports, and clearing and grubbing.

Hybrid lump sum items are very similar to regular lump sum items. Both will show a unit of one on the bid summary sheet. With hybrid lump sum items the contractor will bid on the item as a lump sum, but the item is entered into *Trns•port Estimator* with a quantity and unit price. Quantities and unit prices must be included in the estimate. Hybrid lump sum items are identified by an “A” as the last character in the [item number](#).

Data entry for these items is required . Follow the steps below.

- With the group highlighted choose the appropriate hybrid lump sum item.
- Enter the item quantity in the quantity box.
- Right click and select either reference or cost sheet to price. **WARNING:** Do not enter prices at the unit price level in the upper right area within the unit price box. Prices entered here will not pass into the main system and data will be required to be re-entered into the program.
- Highlight the item and click on the box under the Name Column. It will show a window that gives the option of creating a reference sheet or cost sheet price basis (don't worry about the other two options).
- For a lump sum item choose the cost sheet item. Click the green “GO” button and fill out the cost sheet.

Anticipated Items

Anticipated items are used to provide a funding mechanism for non-biddable elements of work that may be needed to complete a project. All anticipated items need to be identified prior to submitting PS&E to OPL. The use of anticipated items is acceptable when there is a high likelihood that [non-biddable](#) cost will be incurred.

Examples of common anticipated items include:

- Statistical asphalt bonus

- Asphalt smoothness bonus
- Railroad flagging
- [Asphalt escalation](#)
- [Fuel escalation](#)
- [Steel escalation](#)
- Public information and relations
- Migratory bird monitoring

ODOT receives guidance from FHWA on this matter. FHWA believes that anticipated items should not be created for items of work that can be competitively bid. ODOT and FHWA's policies discourage the use of anticipated items for unfinished and incomplete design work. Using anticipated items in this manner will result in negotiations between ODOT and the contractor, most likely resulting in a higher price than if it had been bid competitively.

Do not include any project work items that can be identified, quantified, designed and bid as an anticipated item. For the occasional special item that might need to be fixed, rebuilt or modified (not due to any Contractor negligence) during the progress of the work to complete the project, the project team can request approval for the anticipated item.

Non-standard anticipated items must have additional approval and secured funding before being added to project cost. Requests for anticipated items must be approved in writing by the Area Manager and the OPL Manager for all non-standard anticipated items on all projects. FHWA must also approve non-standard anticipated items on full federal oversight projects.

For more information on anticipated items, reference [Operational Notice PD-07](#) and the [PS&E Delivery Manual](#).

Incidental Items

Incidental items are considered minor work items necessary to complete an individual [bid item](#) or if no bid item is included in the project, (specifically identified in the Oregon Standard Specifications) incidentals are minor work items necessary to complete a specific task. Incidental items are items for which there will be no separate or additional payment. If the incidental work items or tasks are more than three percent of the total cost of a primary bid item, a separate bid item is required for the work item. Combining work items or tasks, and making them incidental to other work is not appropriate and is not recommended. Only include the following items as incidental when there is little of this type of work on the project.

00210.90 - Mobilization

00310.90 - Removal of Structures and Obstructions

00320.90 - Clearing and Grubbing
00335.90 - Blasting Methods and Protection of Excavation Backslopes
00340.90 - Watering
00370.90 - Finishing Roadbeds and Slopes
00445.91 - Sanitary, Storm, Culvert, Siphon, and Irrigation Pipe
00495.90 - Trench Resurfacing
00610.90 - Reconditioning Existing Roadway
00706.90 - Emulsified Asphalt Slurry Seal Surfacing

Entering Incidental and Breakdown Data

To enter incidental and breakdown data follow the directions below.

- Highlight the selected bid item. Right click and select “Cost Sheet”.
- Highlight the cost sheet description in the [tree view](#).
- Select the “Materials” tab at the bottom of the sheet
- Highlight the box under the “Description” box in the lower right side of the page and enter a description of the incidental or breakdown component of the bid item.
- Select the box under the unit’s box and use the drop down menu to select the unit of measure.
- Select the box under the quantities box and enter the quantity that is identified in the special conditions for the work item.
- Select the box under the “Unit Price” box and enter the estimated unit price for the work component.
- Select “Enter” and repeat the process for every incidental item or breakdown item not already listed in the unit price or cost breakdown schedule.
- Highlight the selected bid item again and verify that all the bid components are selected. Note: this will prompt a “Honda” error that is ignored in these cases.
- Select the “Notes” tab in the upper right half of the screen; enter the date of the information provided in the cost breakdown, the source of the data, and the contact person for the data.

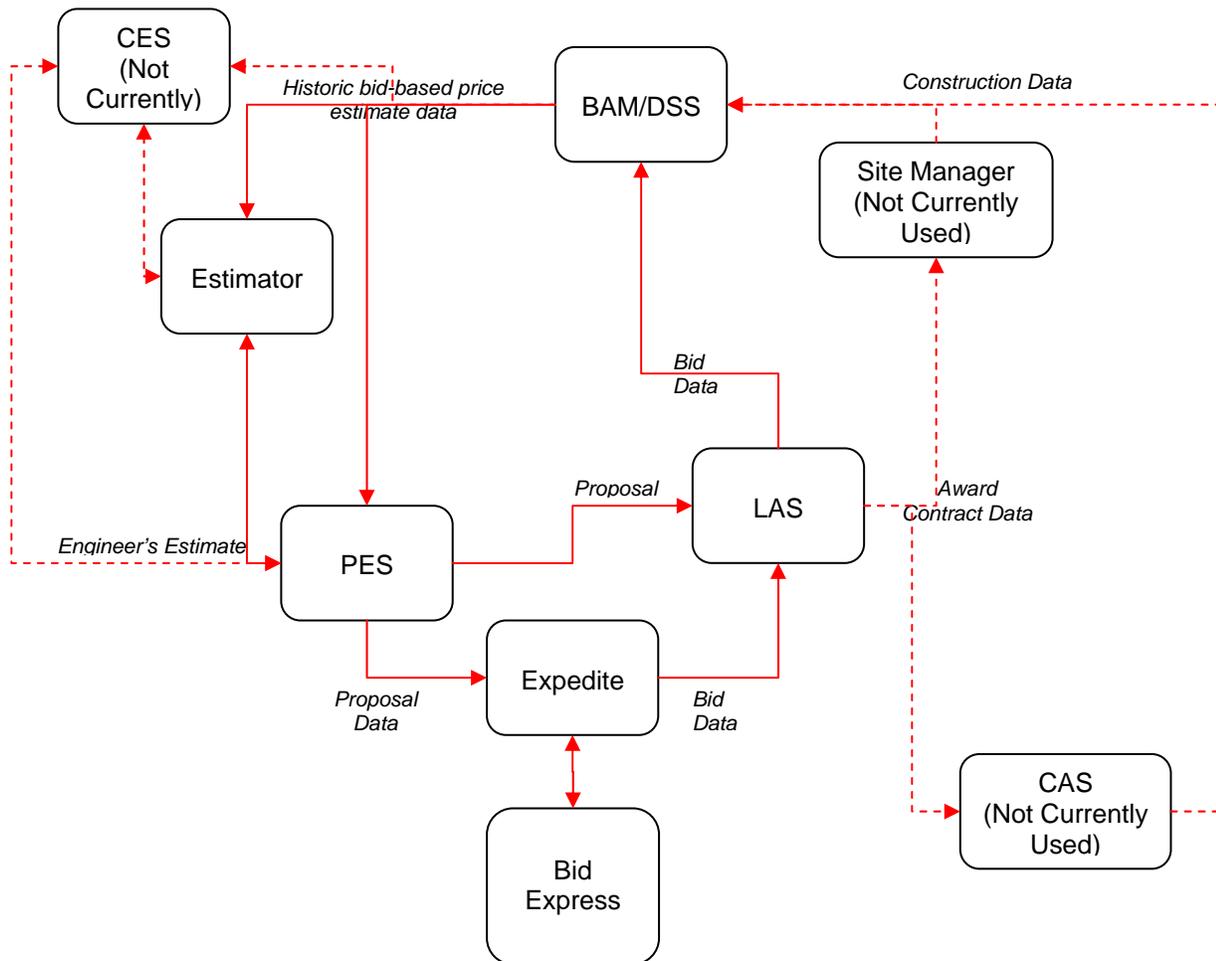
Overview of *Trns•port*

Trns•port is an information system for managing transportation plans within a large agency, such as Oregon Department of Transportation, that is owned by AASHTO (American Association of State Highway Transportation Officials). This system starts the process from the planning and estimating stages through the development of bidding documents, letting and contract award, and management of the construction operations. ODOT, like most state departments of transportation, uses the *Trns•port* system for projects.

The *Trns•port* Programs used by ODOT Office of Project-Letting include:

- [BAM/DSS](#)
- [Estimator](#)
- [Proposal Estimates System \(PES\)](#)
- [Letting and Award System \(LAS\)](#)
- [Expedite](#)
- [Bid Express](#)

Flowchart of the Trns•port System.



The above flow chart shows how all the different *Trns•port* modules work together. The only modules ODOT does not subscribe to are the CAS (Construction Administration System), Site Manager, and CES (Cost Estimation System). These two modules are used once the project is in the actual construction phase; ODOT uses the legacy Contract Payment System for this phase. The following sections of this Manual include descriptions for all eight different *Trns•port* modules plus Bid Express. Bid Express is not part of the *Trns•port* system but works in conjunction with *Expedite* to turn proposal data into bid data.

Description of Different Trns•port Modules

BAM/DSS (Decision Support System)

BAMS/DSS is the software product for analysis of highway construction bid and project data. Data passes through this core analysis module, called the *Decision Support System (DSS)* into its database from the other Trns•port modules. Analysis and data from *DSS* is passed back to a particular module, e.g. Estimator, to provide additional functionality. *DSS* uses the statistical software SAS as a backbone.

DSS contains a historical database specifically designed to assist in the planning and budgeting process as well as provide decision support in bid review and evaluation, collusion detection, vendor (contractor) analysis, and item price estimation. *Trns•port BAMS/DSS* maintains a historical repository of contract information from all phases of the contract life-cycle, and has built-in analysis models to support the wide variety of management information requirements. *Trns•port BAMS/DSS* also provides ad hoc analysis capabilities which allow ODOT to use the information contained in *BAMS/DSS* to respond to a wide variety of executive and legislative requests.

Office of Project Letting staff uses the *BAM/DSS* module.

Estimator

Estimator is a stand alone software package specifically designed for estimating the cost of highway construction projects. *Estimator* uses bid-based item price estimation data from *DSS* (Decision Support System). *Estimator* works well for distributing the estimation function throughout Region offices and for exchanging data with design consulting firms.

Project team Specification Writers and Estimators create the project estimate in *Estimator* and submit the *Estimator* file to the Office of Project Letting.

CES (Cost Estimation System)

The *Cost Estimation System* is a PC-based job and program cost estimating and planning tool. It provides a highly productive environment for preparation of parametric, cost-based and bid-based job cost estimates. *CES* provides a full range of cost estimating and scheduling support capabilities, from preliminary estimates needed for program planning to the final engineer's estimate required for award approval. Once a job is defined in *CES* and an estimate is produced, *CES* supports the combination of jobs into a work program involving setting priorities and considering alternate programs for construction planning over a multi-year period. In addition, *CES* manages job and program scheduling with

funding analysis and budget projections, including inflation adjustments and alternate inflation scenarios.

ODOT does not subscribe to this module.

PES (Proposal and Estimates System)

The *PES* module has the functions associated with preparing the detailed cost estimate for the PS&E package and proposal documents for the contract bid letting. *PES* capabilities include the automated generation of item cost estimates from the historical bid data stored in *BAMS/DSS* for the Detailed Cost Estimate Report. *PES* also automates the creation of bidding proposals from project information without the re-entry of item level information. Multiple projects can be combined into a single proposal with common items combined and estimated. *PES* has been designed to offer maximum flexibility in project definition, including provision for multiple funding sources, non-participating items, alternate items and item-category specifications, the identification of special provisions and supplemental specifications, and addendum processing.

OPL's Pre-letting staff loads the estimator files into *PES* to create the Bid Sheets and to track project estimates. ODOT's Procurement Office also uses *PES* for reports.

Key *PES* Reports:

- Preliminary Detailed Cost Estimate and Funding Summary
- Proposal Schedule and Special Provisions Listing
- Proposal Schedule with Estimated Prices
- DBE/WBE Item Estimate Report

LAS (Letting and Awards System)

LAS is used in advertising bids, processing bid information, evaluating bids and making award decisions. The *Letting and Award System (Trns•port/LAS)* provides on-line and batch data entry with full edit checking and verification for vendor bids. It produces the bid tabulation report, and performs analyses on received bids. Additionally, *LAS* maintains the plan holder's list, produces mailing lists, and maintains information for invoicing vendors for proposals and plans purchased.

Upon proposal award, a Final Detailed Cost Estimate report and a Contract Schedule of Prices report can be produced using the awarded contractor's prices, and then the data can be passed to the *DSS* module. ODOT also uses InfoTech's Electronic Bidding System. *Bid Express*, which includes a program, *Expedite*, to create electronic proposals from *Trns•port PES* data. This enables contractors to bid electronically on proposals, and ODOT to load electronic bids into *Trns•port LAS*.

OPL's Estimators use LAS to pick the low bidder and to analyze bids and bid items. LAS is used in conjunction with PES.

Key *LAS* Reports:

- Notice to Contractors
- Bid Tab Edit
- Bid Letting Summary
- Bid Tab Analysis
- Low Bid Analysis
- Contract Schedule of Prices
- Final Detailed Cost Estimate and Funding Summary

Expedite

Expedite allows bidders to receive proposal information, enter all information required for a valid proposal, and submit item bids. Item extensions, section and proposal totals, and DBE percentages are calculated and displayed immediately. The software alerts contractors to omissions and incorrect alternates and prevents computation errors. *Expedite* can exchange data with *Trns•port PES*, *LAS*, and similar systems, and can share proposal information with other word processing, database, or spreadsheet software. Standard, customizable reports are provided (Bid Submission Report, Bid Error Report, and Amendment Report), as well as a custom report feature.

Contractors use *Expedite* to send the bid information confidentially to OPO via Bid Express.

Bid Express

Another component of the online bidding process is *Bid Express*, a web-based subscription service which provides one-stop access to electronic bid information from participating state transportation departments. Prospective bidders using *Bid Express* can access an agency's historical and current letting information as well as schedules of prices and items for each contract, eligible bidders, plan holder lists, bid tabulations, and addenda. Contractors have instant access to bid information from all over the country. *Bid Express* enables secure online bid submission. By using *Bid Express* in conjunction with *Expedite*, contractors can download letting information, prepare bids, and submit proposals electronically with improved accuracy and time-efficiency.

ODOT actively uses Bid Express as the electronic bidding service for contractors to submit bids.

Site Manager

Site Manager is a comprehensive client/server based construction management tool. It allows for data entry, tracking, reporting, and analysis of contract data from contract award through finalization. The main functions of *Site Manager* are daily work reports, contract records, contract administration, contract payments and materials management.

ODOT does not subscribe to this module.

CAS (Construction Administration System)

Construction Administration System manages contract information from award to final payment. This module addresses ODOT's [Construction Section](#)'s needs regarding contractor payments (partial/final), funding participation allocation, subcontract approval, and tracking and changes to original contract specifications (change orders and supplemental agreements).

ODOT does not subscribe to this module

Trns•port Estimator

The many aspects of *Trns•port Estimator* will be explained in detail in the following sections. For Estimators needing a quick review on how to create an estimate in *Trns•port Estimator* there is a list of basic steps in [Appendix A](#).

Catalog

Trns•port Estimator is a stand alone software package specifically designed for estimating the cost of highway construction projects. Within *Trns•port Estimator* the data for producing estimates is stored in one or more catalogs which include item related code tables and historical item prices. Catalogs are made available for use in the *Trns•port Estimator* module and can be found in the Bid History Catalogs section of the [ODOT Estimator website](#). Catalogs are updated semiannually and are only useful when downloaded and used in conjunction with *Trns•port Estimator*.

There are two options of catalogs that can be downloaded on the website. One option (i.e. "2009 – 1st Qtr – 1yr") has one year of bid history. The second option (i.e. "2009 – 1st Qtr – 2yr") has two years of bid history. With either catalog it is best to have an understanding of the market area and market pricing. In most cases the catalog with two years of data will be used. This catalog is the default catalog and is more stable in the pricing structure of the items. The catalog with one year of data is used mostly for trending and should be used with great caution since it could put the bid in risk of being unbalanced.

Set your *Trns•port Estimator* to the current catalogs on the OPL server.

- 1) Open *Trns•port Estimator* and select "Tools" > "Global Options".
- 2) In the "Estimator Options" window select the URLs tab.
- 3) Point *Estimator* to the catalog location on the server.
 - a. Click the "Browse" button to the right of the "Catalog Path" (HTTP of file) field.
 - b. In the "Folder" field, enter "[\\s-salemrev-22\EstShare\Cat](#)".
 - c. Click on "Apply" > "OK"
- 4) Verify that catalogs can be accessed.
 - a. Select "Tools" > "Open Catalog".
 - b. The catalogs should be visible. If not, call your *Estimator* system administrator to verify access permission.

Verify the current catalog is being used. If not, download and import the most current catalog into *Estimator*.

Skeleton File

When preparing an estimate in *Trns•port Estimator*, a project skeleton file can be imported as the initial step in creating an estimate. This file contains information that will help with the estimating process. These files contain general project information and standard item groups to which items, quantities, and cost estimates can be added.

The Skeleton file can be found on the [ODOT Estimating website](#) under the Project Skeleton File Section.

- From the website, click on the Region the project is in. This will link to the ftp site where the skeleton files are stored. Save the skeleton file to a location on your PC.
- Each project that is being bid on will have a specific skeleton file.
- Within the skeleton file the project key number, specification year, description, and groups that the items will be placed in are given.

Importing a File to *Trns•port Estimator*

To import a file into *Trns•port Estimator*, select “File” > “Import”. Once the import screen opens up locate the file and click “open”.

Mandatory Parameters

After the skeleton file is imported, the estimating process can be started in *Trns•port Estimator*. There are four mandatory settings that must be followed in order to complete the estimate correctly.

1. **Set your “Caps Lock” to ensure all text is in capital letters.** *Trns•port Estimator* and the client *Trns•port* modules only recognize capital letters.
2. **Do not modify the “Description” imported via the skeleton file.** The description on the estimate page must match the official title in PCS.
3. **Always check “Only *Trns•port* Items and Codes Allowed”.** When your estimate file is open, select “Edit” > “Estimate Options” and check the box next to “Only *Trns•port* Items and Codes Allowed”.
4. **Always fill out all fields on Page 1.** When starting a new estimate, all header information on Page 1 must be completely filled out (see Initial Estimate Page).

Initial Estimate Page

Once *Trns•port Estimator* is open, and before any groups or items are added, users must make sure that the two pages of the Estimate file are completely filled out. Below are lists of the fields on the two pages which need to be completed.

Description of All Fields on Estimate Page 1

The screenshot shows the 'Estimator - [Estimate]' window. The main form area is divided into several sections. On the left, there are fields for Estimate ID (A), Spec Year (B, '08'), Base Date (C, '9/ 2/2009'), and Unit System (D, 'E'). Below these are Longitude of Midpoint (E) and Latitude of Midpoint (E) fields, both with '(DDMMSS)' labels. A District field (F) and a Federal/State Project Number field (G) are also present. A large Description field (H) is located below these. On the right side, there are dropdown menus for Work Type (I), Highway Type (J), Urban/Rural Type (K), and Season (L), along with a County field (M). At the bottom right, there are numerical input fields for Estimate Cost (0.00), Contingency % (0.00), and Estimate Total (0.00). Below the main form is a table with columns for Group Name, Group Total, Alternate Code, and Description. The table contains one row for Group 0100 with a total of 0.00 and description 'Initial Group'. The status bar at the bottom shows 'Ready' and 'NUM'.

- A) Estimate ID: Type the key number here.
- B) Spec Year: This is the year of the specification book that is being used. The current default is “08”.
- C) Base Date: This is the bid date for the project.
- D) Unit System: The units that are used for the bid. Enter “E” for the English System.
- E) Latitude of Midpoint/Longitude of Midpoint: This is the center point location of the project. ***This information must be entered in as Degrees-Minutes-Seconds and not decimal degrees.***
- F) District Field: This is used to identify the Region number. ***Do not enter the maintenance district.***
- G) Federal/State Project Number: Federal or State project number for the Construction Engineering phase.
- H) Description: The official project name from the STIP, originating with PCS. ***Do not modify this description from what originates with the skeleton file.*** This name must also match other project documents exactly.
- I) Work Type: This should be selected based on the area of work with the highest estimated cost. See [Appendix B](#) for the list of items.
- J) Highway Type: Select the type of highway for the project.

- K) Urban/Rural Type: Choose the setting for where the project is located. For help in determining this, refer to chapters 7 and 8 of ODOT's [Highway Design Manual](#).
- L) Season: This should be the season for when the project is being completed and not when the work is being bid. Jobs over one year in duration should use the summer season.
- M) County: This is the county where the project is going to be completed.
- N) Contingency %: This is the percentage for the contingency account. ***This must be set to the default of 3.5%.***

Description of All fields on Estimate Page 2

The screenshot shows the 'Estimator - [Estimate]' window. The top section contains the following fields:

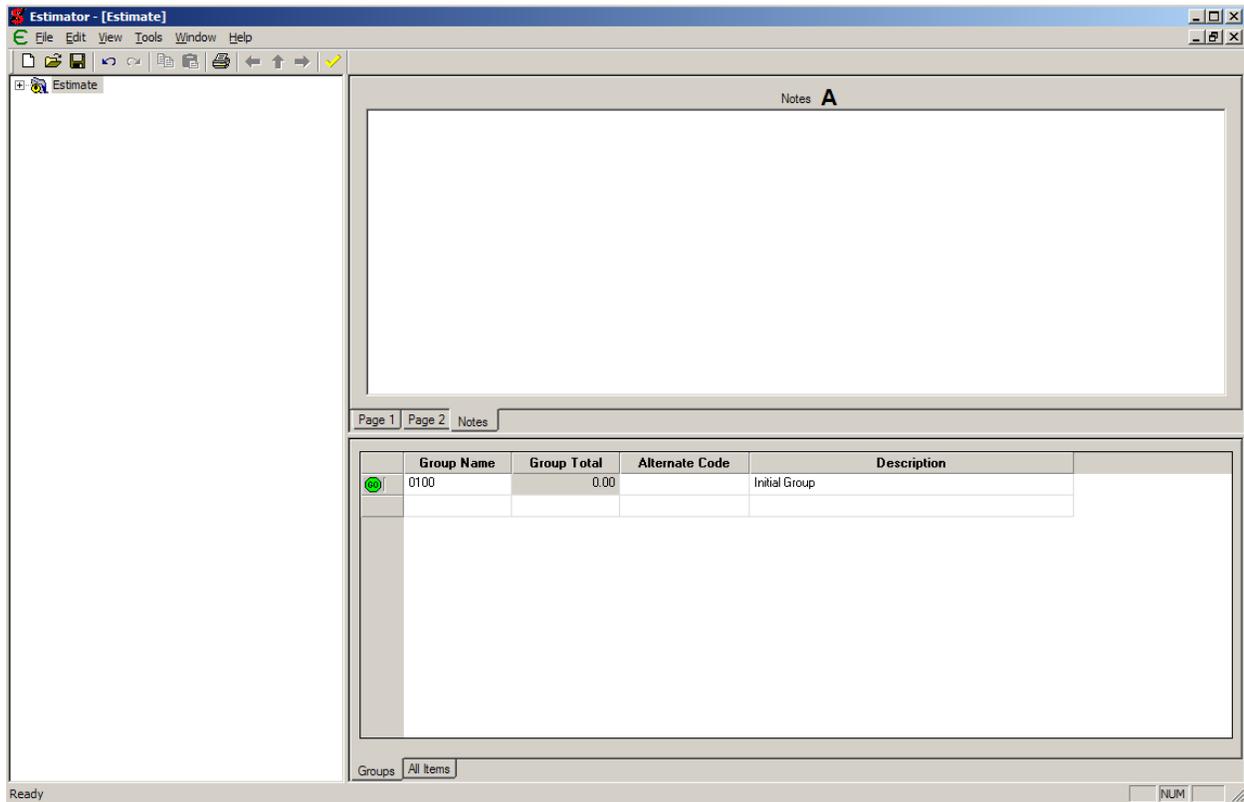
- Estimated By: [Text Box] [Date: 8/13/2009] **A**
- Checked By: [Text Box] [Date: 8/13/2009] **B**
- Approved By: [Text Box] [Date: 8/13/2009] **C**
- Estimate Type: [Text Box] [Text Box] **D**

The bottom section is a table with the following data:

Group Name	Group Total	Alternate Code	Description
0100	0.00		Initial Group

- A) Estimated By: Name of the person creating the estimate.
- B) Checked By: For the person checking the estimate.
- C) Approved By: For the person who approves the estimate.
- D) Estimate type: Not currently used.

Notes Tab in Estimate File



- A) Notes that are entered here are used to communicate with OPL and cost Estimators. Useful information to add into the notes tab includes:
- If there is an unusual bid items selected
 - If incidental items are selected
 - If further assistance will be needed at the point of document review.

Ways to Create an Estimate in Estimator

There are two main ways to create an estimate in *Trns•port Estimator*: build an estimate from scratch in the skeleton file or copy information from a template into the skeleton file for a project.

Building an Estimate From Scratch

Verify the [skeleton file](#) has been [imported](#) with the correct key number from the Region folder. To start building the estimate, follow the directions below:

- Open all the groups for viewing.
- Make additions and changes to the group descriptions as required. If necessary, [add groups](#).

3. Adjust the group numbers to sequentially increase in increments of 10, 5, or 1 as needed for the project. Note: categories 1200 and above are reserved groups. Do not select numbers above 1200 for group items except 9400 and 9800.
4. Primary group numbers match the Oregon Standard Specifications for Construction parts. Added groups use the third and fourth digits within the primary group. Always use 9400 for anticipated items and 9800 for construction engineering. Group 1200 is for bid items added by addenda during project advertisement.
5. Make additions and changes to bid items as well as [add unit items](#) as required. When adding items, maintain the bid item order that is customary to ODOT's bid item list. Do not re-number estimate items until the item entry process is completed.
6. For miscellaneous items enter the [supplemental bid item description](#) in the Supplemental Description box. This will be the bid item name on the bid schedule.
7. Provide information in the ["Notes" tab](#) when needed to communicate with OPL and cost Estimators.
8. Verify data entry. From the "Edit" menu choose "Verify Estimate". This provides a log of data anomalies. In a few cases, it is also used as an error editor.
9. [Save the file on a Region approved and secure folder](#). Do not re-save work in the skeleton file.

Copying an Estimate from a Template

Standard templates exist which can be used for large projects that are developed and maintained by OPL's Estimators. These templates are provided in the Region folder. Users can copy entire groups or individual items from the template into the [skeleton file](#) that is open in *Estimator*. Move the group or item number as needed to find the proper location in the skeleton file.

Templates are best used with no prices (cost, reference or bid based) attached to the bid item. This allows printing of the summary sheet without prices attached. The alternative is to turn off the check box for each price item to allow printing without prices.

Pricing after copying templates and bid items is managed as follows:

- Go to "Edit" > "Update Price Information"
- From "Update Price Information" select "Refresh Time Dependant Data and Cost Sheet Structure".

This process replaces old cost data with prices from the price [catalog](#) the Estimator is currently pointing to (the option the Estimator chose when they started the program).

Groups

In *Estimator* a group is an overall heading for related items in an estimate. An example is “Wearing Surfaces”, which could include items such as Emulsified Asphalt in Tack Coat, Level 3 ½” Dense HMAC and Concrete Walkway, among others.

Group Numbers

Standard Group Numbers are given below:

- Group 0200 – Temporary Features and Appurtenances*
- Group 0300 – Roadwork
- Group 0400 – Drainage and Sewers
- Group 0500 – Structures (Further Breakdown Below)
 - Groups 0500-0519 – Cast-In-Place Structures
 - Groups 0520-0539 – Pre-Cast Structures
 - Groups 0540-0549 – Cast-In-Place Retaining Walls
 - Groups 0550-0559 – Steel Structures
 - Groups 0560-0569 – Pre-Cast Sound Walls
 - Groups 0570-0599 – Miscellaneous Structures
- Group 0600 – Bases
- Group 0700 – Wearing Surfaces
- Group 0800 – Permanent Traffic Safety and Guidance Devices
- Group 0900 – Permanent Traffic Control and Illumination Systems
- Group 1000 – Right-of-Way Development and Control
- Group 1100 – Water Supply Systems
- Group 9400 – Anticipated Additional Items
- Group 9800 – Construction Engineering

*NOTE: The “Training” line item should be included in the 0200 Group

Adding a Group

There are two ways to add a group:

1. Click on “Edit” > “Add Group”.
2. Or, right click on the Estimate file in the view on the left side of the screen and select “Add Group.”

HELPFUL HINT: Once a group is created, more can be added by right clicking on the first group and then copying and pasting it.

Adding a Group Header

Click on the group to open the group information. Enter in the group number and add a short description to identify the group. The groups should be numbered in intervals of ten. By adding the group number and the short description, Estimators will know what

items are going to be placed there. For bridges, include the bridge number in the description. Each bridge or structure is its own group, with its own set of bid items.

Bid Items

[Bid items](#) are the means by which the contract work is paid.

Adding an Item

1. Click on the Group that the bid item needs to be added to.
2. Click on the space below the item number on the lower half of the screen.
3. Select the drop down arrow and search for the item from the full standard bid item list (or begin typing the bid item code to go immediately to nearby items).
4. Click on the item when it is found and the item information appears on the line. The designer's quantity will also be entered on this same line.
5. Click on the next empty line and repeat the process until all items and quantities are entered for that group.

Supplemental Descriptions

Enter the supplemental bid item description only when creating an item through the use of a miscellaneous (9Z9) item. This description will be the bid item name when the project is set up for advertisement.

Adding Unit Prices

Click on the item listed on the tree to the left or hit the green "GO" button on the line just created above. This takes you to the detailed information for each item. This is where unit price information is added. One or two unit prices may already have been automatically listed here; a Reference Price that represents the statewide average from the current catalog, and/or a Bid-Based unit price that represents an average regional price calculated from the current catalog. To enter the designer's unit price (or estimator's unit price) follow the directions for each of the boxes named below:

- Name – Click in this box and a window opens to select a "Price Basis Type". Select "Reference Price" and click "OK". Enter the unit price and type "DES" in the Name box for the designer ("EST" for the estimator) who is the source of the unit price.
- Active – These check boxes allow the estimator to choose which unit price to make "active". The active price is the one that will show in the estimate. Be sure only one box is checked – the program will add the unit prices together if multiple boxes checked.

Breakdown of the Item Number

The item number is a set of numbers and letters that help to describe the item. Below is an example item number:

Example item number: 0225-2C00400 E

- The first four numbers (0225) in the item number are the specification number that item falls under.
- The dash following the first four numbers shows that this item is in the English unit system. If the dash were replaced with a dot (•) then it would be in the metric unit system.
- The last letter in the item number (E) shows the unit of measure that the item is. The “E” stands for each.

To view what all the last letters in the item number mean see [Appendix C](#).

9Z9 Items

9Z9 items are miscellaneous items that are used for items that don't appear on the ODOT Bid Item List. Use miscellaneous (9Z9) bid items only in situations where no standard bid item exists. Enter the name of the item in the Supplemental Description box so it appears on the bid list. All unit price information is manually entered for these items. These items are one of a kind, non-recurring bid items. This is only to be used when absolutely necessary.

HELPFUL HINT: If a 9Z9 item is absolutely required, find an existing bid item that comes close to the 9Z9 bid item and revise the description. Then estimate and save.

Saving Estimates

Note: before saving an estimate the “Verify Estimate” option should be selected under the “Edit” dropdown window and all errors need to be corrected.

Settings for Where Files are Saved

To make sure that the information and the bids are getting saved to the right location complete the following steps.

1. Select the “Global Options” from the “Tools” menu.
2. Click on the “URL's Tab.” This page contains the paths for the catalog directory, the estimate directory, and the template folder.
3. The “Estimate Folder” path is the directory to which new estimates are saved. Default to Local Drive C:\Estimator directory.
4. The “Template Folder” path is the directory where estimate templates are kept.

Remember that *Trns*port Estimator* Global Options are set to SAVE every 15 minutes. However, save often in case of a power outage etc. Select “Save As” for the “File” menu the first time it is being saved. Set up the drive and folder where the estimates should be saved. For file sharing of the estimates with a team, there will need to be a shared drive, i.e. S:\Trans*port\OHD etc. The key number should automatically appear in the File Name field. To save an estimate already saved once select “File” and “Save.”

How to Save a Completed Estimate File

For completed estimates ready to be saved to the Region secure folder follow the directions below.

1. After completing the final version of an estimate, click the “Save” option under the “File” drop down menu.
2. Navigate to the folder on the local or server drive where estimate files are normally saved. Note: Do not save preliminary versions of an estimate in the Region secure folder on the *Trns•port* s-salemrev-22 server, this folder is reserved for final PS&E estimate files only.
3. Set the “Save As” type file to “Estimate File (*.EST)”, name the final estimate file using the key number followed by PS&E, i.e. 14030PS&E, and click the “Save” button.

Export the completed estimate file formatted for upload to Trns•port PES.

4. From the “File” drop down menu, select the “Export” option.
5. Navigate to the folder on the local or server drive where the estimate files are normally saved.
6. In the “Save As Type” field, click the drop down arrow and select “PES Project File” (5.4 and earlier).
7. Name the final estimate using the key number followed by PS&E, i.e. 14030PS&E, and click the “Save” button.
8. Click the “Yes” button when the dialog box opens asking “Do you want this exported file to include category descriptions?”

Copy the completed files to the Region Secure Folder.

9. Navigate to where the two final estimate files are saved, one with an extension of *.est, and another with a *.dat extension.
10. Highlight the two estimate files, go to the edit drop down menu and select the “Copy” option.
11. Navigate to the Region secure folder on the *Trns•port* s-salemrev-22 server, right-click and select the “Save” option.

System Does Not Update for Inflation

Trns•port Estimator does not adjust or account for inflation. The [catalogs](#) that are used in conjunction with *Trns•port Estimator* can help alleviate this problem. These catalogs look at data from the past two years which helps provide a more stable price structure. The only way for an estimator to adjust for inflation is to understand and have experience dealing with the market and prices. It is best to check with ODOT staff in OPL, who perform cost estimates everyday and are close to the information, to get a better idea of how the market is doing, but it can still be very hard to predict. Because market prices can be so volatile, the price at the time of bid is taken to be the final price and is locked into place by the contract.

Additional Information to Remember

The following list includes items that should be kept in mind when using *Trns•port Estimator* to create a bid:

- Quantities must be entered in hundredths or larger. There should be no entries to three decimal places.
- Prices must be entered in whole cents – no portions of cents. Note: *Trns•port Estimator* often shows numbers in portions of cents. Ignore this and do not attempt to change or round entries internal to the system.

Both these concerns are automatically addressed when “Only *Trns•port* Items and Codes Allowed” is selected. Accomplish this by:

1. Select “Edit” > “Estimate Options”
2. Check the Box in front of “Only *Trns•port* Items and Codes Allowed”.

Escalators

This section is for Specification Writers and Estimators accounting for fuel, asphalt, or steel escalation. For each project Specification Writers will determine if the project will be affected by fuel or steel escalation. They will then indicate in the specifications section which escalation clauses are to be added.

ODOT has established several escalation clauses for specific commodity pricing. These clauses help account for unforeseeable price increases that may arise during the construction phase of a project. For example, if a contractor opts in for fuel escalation, the project receives price relief in both directions as the commodity price fluctuates (i.e. the contractor is due money if the price of fuel rises; the contractor owes money if the price in fuel drops.).

The Specifications Writer is encouraged to contact the Senior Cost Estimator to discuss questions about a specific project or circumstance.

Fuel Escalation

The fuel escalation worksheet can be found on [ODOT's website](#). Specification Writers use this worksheet to determine if the fuel escalation clause is needed. To utilize the fuel escalation worksheet the *Estimator* file must be exported as an *Excel* file with the file extension .xls. From the *Excel* file, the bid item data for the estimate is to be copied and then pasted into the fuel escalation worksheet. Additional instructions for completing the fuel escalation worksheet are available on [ODOT's Estimation website](#).

Asphalt Escalation

To account for asphalt escalation, the Estimator needs to go to [ODOT's website](#) where they will find all the current prices of asphalt. At the website, open up the most current "Monthly Asphalt Cement Material Price" (MACMP) list. This list has the current price for asphalt for that month. This should be used when completing a bid.

Steel Escalation

Due to the fact that the price of steel is increasing/decreasing at a fairly predictable rate, and does not look like it will be changing drastically, the steel escalation clause is not often used. Use the steel escalation worksheet when conditions apply and the price of steel rises at an unforeseeable rate. This worksheet can be found on [ODOT's website](#).

Contingency Percentage

Fixed Contingency

The contingency percentage is used to account for added cost to the contract that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties in the project scope. This is not to be used to avoid making an accurate assessment of expected costs for the given project scope. AGC (Associated General Contractors) and the Oregon Transportation Commission have agreed that a contingency percentage of 3.5 percent of total project costs should be included. ODOT requires the final contingency percentage to be 3.5 percent. Reference [Operational Notice PD-08](#) page 5 on how to request a higher contingency.

Variable Contingency

When building estimates at earlier stages of a project (i.e. at preliminary or advance stage) using a contingency of a higher percentage may be warranted in order to better reflect the incomplete nature of the project at that stage.

Common Mistakes

Common Mistakes When Completing an Estimate

Here is a list of common mistakes routinely made when an estimate is being created. The estimator needs to make sure the following mistakes are caught and corrected as they can have a large affect on the overall price of the estimate.

- The wrong bid item gets picked from the *Estimator* bid item in the system. Always check to make sure that the bid item that is being selected is the correct one.
- The unit of measure for the bid item is incorrect.
- New bid items that are not in the system are given unit prices that are inaccurate. For new bid items the estimator needs to choose a bid item that closely matches the new item. A supplemental description that accurately describes the item should be included. For new bid items unlike any existing items the estimator must submit a new bid item form.
- Hybrid lump sum items are used incorrectly or not used at all. Refer to the [hybrid lump sum](#) section and the [lump sum](#) section for clarification.
- Hybrid lump sum items often get entered with quantities of one. Make sure that all quantities match the actual specification quantities.
- [Incidental items](#) in a project are added to the wrong bid items. Make sure that the incidental items are added to the correct bid item.
- Miscellaneous (9Z9) items are used incorrectly. They should be used only when a standard item can not be found to pay for the work.
- With [non-biddable items](#) the “Exclude Item from Reference Price Calculations” box is not checked. This box has to be checked in order for the estimate to be accurate.
- The bid item called “Construct and Remove Detours” needs to account for both the installation and removal of detour materials.
- Bid items are added with quantities beyond two decimal places.
- The [fields in Trns•port Estimator](#) are not always filled out completely.

- Estimators enter incorrect [percentage values](#) for Mobilization, TP&DT, Construction Survey Work, Erosion Control, and Construction Engineering.
- Estimators try to adjust for inflation by entering funds as contingencies. Contingency is 3.5 percent on all final estimates.
- Relying solely on the bid history catalogs and not entering unit prices adjusted for the specific project.
- DO NOT COPY NUMBERS/PRICES FROM EXCEL AND PASTE THEM INTO ESTIMATOR. This really throws off the estimate and can cause a lot of trouble.

When creating an estimate always remember the four [mandatory parameters](#) and all the [additional information](#). These will help to create estimates without mistakes.

Distribution and Review of Estimates

Distribution of Estimates

Scoping through DAP Estimates:

Full detailed project estimates will be allowed to be posted on share drives or other central locations that can be seen by ODOT employees only. The estimate continues to be a secure document and should not be posted in public locations or distributed beyond the project team.

Estimates in the scoping through the DAP estimate milestones do not look similar enough to the bid documents to be as high of a security risk, and the benefits to the project team to see the entire document when making large scoping decisions outweigh these risks. As the project progresses, quantities and bid items will continue to change and further distance the earlier estimate from the bid documents in the case of a security breach. Special care should be taken to prevent bid item prices from escaping.

A Region may choose a more restrictive estimate review and distribution policy if desired.

Preliminary, Advanced, Final, and PS&E estimates:

Only the zero cost estimates can be distributed to the project team. The zero cost estimate shows only bid items and their quantities, omitting unit prices. On a project specific basis, a project team member may request to review the full estimate. Control and access of this document should be taken seriously and the full estimate should not be posted in a central location, even including an ODOT only share drive or website.

At the preliminary, advanced, final, and PS&E estimate milestone, the project should look a lot like the biddable project pricing and the overall estimate price is much closer to being accurate. In addition, at these final review stages, the focus of the review should stay on assuring accurate quantities and correct bid items versus focusing on unit costs. Widespread availability of this data risks the security of the Engineer's Estimate and violates guidance from ODOT's Audit division and FHWA.

A Region may choose a more restrictive estimate review and distribution policy if desired.

Distribution of the Final Engineer's Estimate

Project Leaders and Local Agency Liaisons will be the primary distribution points for the Final Engineer's Estimate. ODOT specification writers will also have the Final Engineer's Estimate distributed to them for projects that the ODOT specification writers contributed on. This will allow them to use the Final Engineer's Estimate and send feedback. The Final Engineer's Estimate will not be distributed to any non-ODOT specification writers or consultants.

Project Leaders and Local Agency Liaisons should primarily share the Final Engineer's Estimate with ODOT Area Managers when discussing funding decisions in accordance with Region policy. The Final Engineer's Estimate should not be shared broadly or consistently with the project team, regardless of inside or outside the Agency. The official Final Engineer's Estimate developed by OPL is initially developed within a week prior to bid opening and refined with addenda and recent commodity pricing up to bid day. There is little value and high risk in disclosing the Final Engineer's Estimate prior to bid opening, when in waiting a few more days the low bid value and actual cost of the project will be known.

During the final phases of project development, the project team is a part of the development of the estimate. The estimate should NEVER be shared in whole or in part, outside of the immediate project team. It should never be posted on webpages or communicated to the public or to contractors in discussions of the project. Programmed budgetary numbers from STIP/PCS are disclosed through ODOT's contract report and reflect a budget including the biddables, construction engineering, contingency, etc. If this budgetary number is discussed outside the project team, care should be taken to note the inclusion of these components.

The Area Managers (via the Project Leaders/Local Agency Liaisons) are ultimately responsible for the security of the Final Engineer's Estimate and resulting procurement issues that may arise. If the Area Manager determines the Final Engineer's Estimate should be shared, the words "Confidential – ODOT Eyes Only" should be placed on every page.

Review of Estimates

The ability to use an estimate to identify scope and pricing variations is a key tool for project teams to manage a project throughout the design phase. Each Region should establish a common procedure and practice for identifying and reviewing changes between different phases of the project that works with the particular staffing and procedures in the Region.

This is accomplished by first reviewing the detailed cost estimate. The level of changes should be focused on large scope issues, not on specific line items and should be discussed in round values, not pennies. It is realistic that unit prices and quantities change in a reasonable manner over the course of the project.

The lead designer, specifications writer, or Project Leader are positions which could develop expertise in this review.

Once a standard procedure is in place, the distribution of the estimate policy listed above can be modified to include the position performing this function for the project.

OPL is available to work with the Region to develop the best practices for this work after a standard procedure is in place.

The Role of the Office of Project Letting

The Office of Project Letting (OPL) uses six main steps during the advanced stages of the estimating process of a project.

1. Review of the PS&E package – The Pre-Letting Quality Engineer will conduct a review of the PS&E package to ensure that all the deliverables have been completed. This is a high-level review, checking for fatal flaws and legal sufficiency. OPL obtains the Chief Engineer and FHWA approvals during the review phase.
2. Import Estimate into *Trns•port PES* – The project estimate worksheet (*Estimator* file) from the PS&E provider is imported into *Trns•port PES* which then connects to *Trns•port DSS*. The database is used to generate the bid sheets, Final Engineer's Estimate, electronic bidding, and review of bids.
3. Coordinate with ODOT Highway Program Office (HPO) and FHWA – OPL will coordinate with HPO and FHWA to obtain approval to advertise the project. On full federal oversight (non-exempt) projects, OPL will coordinate the FHWA PS&E review.
4. Pass PS&E Documents to Contractor Plans – OPL is responsible for passing on the plans, special provisions, bid sheets, and advertisement to OPO Construction Contracting Section. OPL writes the advertisement.
5. Final Engineer's Estimate – OPL's estimating group performs a review of the PS&E estimate on all projects (including Local Agency projects bid through ODOT) and produces the FEE. The FEE includes any addenda that may occur during advertisement and material cost adjustments between PS&E and bid opening.
In all cases, ODOT's policy is to keep the Final Engineer's Estimate confidential and it is not to be disclosed to any potential bidder in whole or in part.
6. Process Addenda Letters and Letters of Clarification – OPL provides a fatal flaw review of the addendum letter, compiles the letter (including new bid sheets), and sends it to OPO Construction Contracting Section for posting.

This information can also be found in [Operational Notice PD-07](#).

Final Engineer's Estimate

OPL estimating performs a review of the PS&E estimate on all projects that are received from the PS&E provider (including Local Agency projects bid through ODOT) and produces the Final Engineer's Estimate. The Final Engineer's Estimate is produced by having the reviewing estimator make adjustments to unit costs on the PS&E estimate. Generally this means that the PS&E estimate is only being adjusted for pricing for active market trends, location etc. OPL does not completely redo the estimate; rather OPL simply assures that it is accurate and up to date with all the current prices. The Final Engineer's Estimates includes any addenda that may occur during advertisement and material cost adjustments that account for economic market changes on items such as asphalt and steel between PS&E and bid opening.

ODOT's Final Engineer's Estimates are adjusted three times as follows.

1. After it is received for final review,
2. One week before bid for addendums and further adjustments, and
3. Just before the bid date when oil and steel prices move dramatically in the bids the prior week.

Upon completion of the Final Engineer's Estimates, the Cost Estimator will send the Project Leader and the Project Manager (only on projects with Construction Engineering done by ODOT) a brief summary showing differences between the PS&E Estimate and the Final Engineer's Estimates for the major components including major [biddable items](#), construction engineering, [anticipated items](#) and the total price.

Security/Confidentiality of the Final Engineer's Estimate

Nationwide, there are many different beliefs on whether or not to keep the Final Engineer's Estimate (FEE) confidential. FHWA addresses the management of the FEE in a variety of Technical Advisories, but ultimately defers policy to the individual states. However, it is clear within the aforementioned technical advisories, and in conversation with FHWA staff, that they strongly prefer keeping the FEE confidential. Oregon has no statutory requirements that control the FEE either way. Considering this fact, it is clear that the management of the FEE is an ODOT policy decision. [Appendix E](#) contains an ODOT memo from 2004 outlining the management of the Engineer's Estimate.

Protection of the FEE is essential to maintain normal market prices and fair bid competition. Release of the FEE exposes the value ODOT uses to compare the low bid to as well as the unit prices used to determine ODOT's estimates. Leaking of the Engineer's Estimate ultimately leads to price inflation and failed procurements on ODOT projects.

To reduce risk to the confidentiality of the FEE and ODOT, it is paramount that all dealings with the FEE be conducted in close accordance with the ODOT policy outlined below.

ODOT Policy and Procedure

Policy:

1. THE FINAL ENGINEER'S ESTIMATE SHALL BE CONSIDERED AS INFORMATION CONFIDENTIAL TO ODOT. It is not to be shared with anyone other than appropriate ODOT project development personnel, contracted consulting staff, and Local Agencies and their consultants/agents. This confidentiality shall apply during all stages of project development up to the point of formal "notice to proceed" by ODOT's Office of Procurement.
2. This policy applies to all projects being publicly bid regardless of the method of PS&E delivery.
3. It is not ODOT's policy to voluntarily post or disclose in any form the FEE after contract award to the public.
4. When requested, the release of the FEE is to be managed solely by OPL.
5. After formal contract award the FEE will be made available to non-ODOT and non-Local Agency individuals and companies upon written request. This will be done on a project to project basis after approval to release is obtained from OPL. If a contract is not awarded the FEE shall remain confidential.

Procedure:

1. All members of a Project Development Team (PDT) have the responsibility to maintain the confidentiality of the project estimate from project inception through PS&E submittal and formal contract award.
2. After PS&E pre-letting submittal, but before bid opening, a Cost Estimator within OPL will prepare the Final Engineer's Estimate. During this process the following rules will be adhered to:
 - a. The estimate will be reviewed and refined by an ODOT Cost Estimator into the Final Engineer's Estimate. If the Cost Estimator needs clarification regarding any of the project parameters he/she will contact appropriate resources. For outsourced and local program projects, all necessary communication will be routed through the Project Leader (PL).
 - b. The goal of setting the Final Engineer's Estimate is to establish an estimate that is deemed to be a "fair" value for the project to the project "owner". The Final Engineer's Estimate considers factors such as, prior bid item cost history, project difficulty and locale, expected level of competition, current market pricing trends, magnitude of the project, uniqueness of the work, etc.
 - c. An OPL Cost Estimator will communicate the final total value of the Final Engineer's Estimate via confidential e-mail to the Project Leader no later than one week prior to bid opening.
 - d. It shall be the responsibility of the PL to initiate any needed actions and/or responses to the Final Engineer's Estimate. This includes confirmation of adequate funding if the FEE has increased the project cost above the programmed funding amount, as well as desired communication regarding significant estimate changes.
 - e. In all cases, the ODOT Senior Cost Engineer has the final say in establishing the Final Engineer's Estimate.
3. Immediately after bid opening, OPL's Cost Estimator will evaluate the submitted bids following the Bid Evaluation and Cost Justification Analysis. The Cost Estimator will consult with others within ODOT and/or the Consultant and/or the Local Agency, as needed, to develop their final recommendation.
4. The final estimator's recommendation shall be communicated to the OPO-Construction Contracting Section via the Bid Evaluation template letter. This communication will contain confidential information and specifics regarding the Final Engineer's Estimates and the evaluation of the bidder's prices.
 - a. In the case of a recommendation to award, the OPO-Construction Contracting Section will initiate the formal award process.
 - b. In the case of a recommendation to reject the low bid or all bids, the OPO-Construction Contracting Section will seek comment from the Region or local agency regarding this decision prior to making the final determination.

- c. When a case arises where the Region or Local Agency disagrees with the Estimating Unit recommendation, detailed FEE information may be provided to appropriate individuals (i.e. Project Leader, Project Manager).
5. The Bid Evaluation Letter also will contain recommendations regarding the monitoring of specific items and quantities during construction. If the bid is awarded, this information shall be forwarded by the OPO-Construction Contracting Section to the appropriate Project Manager for use during project construction.

Unbalanced Bids

Mathematically and Materially Unbalanced Bids

A mathematically unbalanced bid is a bid that contains lump sum or unit bid items that do not reflect reasonable actual costs or a reasonable proportionate share of the bidder's anticipated profit, overhead costs, and other indirect costs.

A materially unbalanced bid is a bid that generates reasonable doubt that award to the bidder (that submitted the mathematically unbalanced bid), will ultimately result in the lowest cost to the Federal Government.

Note: A materially unbalanced bid must also be a mathematically unbalanced bid. A mathematically unbalanced bid is not necessarily a materially unbalanced bid, however.

A mathematically unbalanced bid shifts the profits and/or costs from one item to other items in the bid schedule. This leaves the overall bid price competitive based on the plan's estimated quantities.

A materially unbalanced bid recognizes a potential error in plan quantities, or the potential to manipulate quantities during construction to maximize profits. A mathematically unbalanced unit price is then submitted on those items. The unit price bid will be high if quantities are expected to exceed plan quantities. The unit price bid will be low if the bidder plans on under-running quantities, otherwise not delivering, or re-negotiating a price or other item replacement strategy during construction.

There are strong incentives for contractors to use unbalanced bidding in attempt to alter the order of the apparent low bid, thereby receiving award of the contract. There are also risks in that the bidder may be forced to produce precisely the estimated quantities, but these risks can be weighed against the possibilities of negotiating price agreements and change orders during construction.

For more information on Unbalanced Bids refer to [Chapter 7 of the Construction Manual](#).

Quality Control

As defined by ODOT's [Quality Assurance Steering Team](#), quality control consists of “routine operational activities designed to consistently produce a predictable result.” In creating an estimate, quality control involves an accumulation of activities designed to ensure adequate quality. Quality control is necessary to ensure estimate errors are found and corrected.

One way to improve quality control is to attend the [Estimator Training Class and become familiar with this Estimating Manual](#). These resources make it easier to identify where mistakes often occur so that they can be avoided.

To ensure all mistakes are found, double check the estimate against the specifications. Verify all bid item quantities and units match those given in the specifications. Errors in estimate quantities and units result in unforeseen costs and inaccurate estimates.

If there is a bid item in the specifications that is new and not in the list of bid items in *Estimator*, select a bid item in *Estimator* that matches as closely as possible to the new bid item to ensure that the price is reasonable. Always, make sure that the [supplemental description](#) is filled out so contractors know what the bid item is for.

Check for [incidental work items](#). Consider whether incidental work items associated with one bid item could be broken into separate bid items. This will allow items to be bid more competitively.

Reference the [Common Mistakes](#) section to check for additional errors.

A quality control checklist is given in [Appendix D](#) outlining the quality control steps for project estimates.

Construction Schedules

The construction schedule is required as a legal document used in developing the contract completion date. It may also be used in the claims process if contract timing issues arise. The construction schedule is created by the designer of the project or the specification writer.

Below is a list of steps on how to create the construction schedule by downloading from *Estimator*.

How to create the construction schedule:

1. Once the estimate has been created and is open in *Estimator*, click “File” in the top left hand corner of the screen, then “Export.”
2. When the “Export” window opens ensure the “Save As Type” says EXCEL 97/2003 WORKBOOK. Then click “Save.” The Excel file should automatically open with the data inserted into it.
3. From this data, copy all the major items and insert them into the Excel file named [Project Production Rates](#) which can be found on the Specification Writers Template page of the ODOT website.
4. Insert the item quantities into the production rate to get the average calendar days of work for each item.

Once this has been completed, it can then be applied to Microsoft Project. This should be used to establish the contract completion date and the Construction Schedule.

The construction schedule needs to show the bid date, completion date, and the time needed to complete major construction components of the project. This document needs to be updated when the estimate is revised. It is highly recommended that the Project Manager reviews the schedule to ensure it is achievable. The project team is responsible for keeping the official copy of the construction schedule with the official project file, in accordance with ODOT’s retention schedule (typically through completion of the project).

The construction schedule is CONFIDENTIAL and is to be shared only with appropriate ODOT personnel.

Build the Construction Schedule with the following items in mind:

- Use quantities from the project estimate downloaded from *Estimator* as described above.
- The schedule must be logical; the start of one activity is usually dependent on the completion of a previous activity.
- What project activities will likely run concurrently?

- Review specifications sections 00290 (Work-In-Water, Noise, Environmental) limitations. Sections 00220 (Lane Closures, Night Time - Day Time work, Festivals, Parades, etc)
- Establish schedule type (A,B, or C)
- What, if any, limitations to On-Site work (00180.40(b)) are appropriate?
- What are flagger and/or pilot car hours?
- Will winter shut-down be required? If so, how long?

Appendices

Appendix A

Basic Steps to Create an Estimate

1. Open the *Trns•port Estimator*® Program
2. Set Caps Lock
3. Set all Mandatory Parameters, including all elements required on the Initial Estimate Page.
4. Import the project skeleton file from the *Trns•port PES/LAS*® export folder.
5. Expand estimate to show group categories identified in project folder – add/change/delete groups using standardized group numbers and naming conventions
6. Add the project bid items under the appropriate groups.
7. Add Anticipate Items (group 9400) and Construction Engineering Items (group 9800).
8. Add quantities to each of the bid items. Print without prices (“Hide Prices” in print options menu) for quantity/item Quality Control
9. Add unit prices from designer for all items.
10. Add “percent of estimate” reference prices for the LS items: Mobilization, TP&DT, Erosion Control, Survey, and Construction Engineering.
11. Add cost breakdowns for incidental and lump sum items in the Cost Sheet price basis areas.
12. Add other reference price information gathered by the estimator.
13. Choose the final “active” price basis on analysis of all data.
14. File naming for work in progress is the key # “xxxxxADV”. Save to the estimate folder.
15. File name for PS&E estimate is the key # “xxxxxPS&E”. Save to the estimate folder.

Appendix B

List of the Options for the Work Type:

ASPH – Asphalt
BASE – Base Course
BRPT – Bridge Painting
CONC – Concrete Paving
CURB – Curb, Gutters & Sidewalks
DBAS – Design Build - Asphalt
DBMI – Design Build - Miscellaneous
DBST – Design Build - Structures
DRNG – Drainage
EROC – Erosion Control
ERTH – Earthwork
FENC – Fencing
GDRL – Guardrail
GENC – General Construction
HZRD – Hazardous Materials Disposal
ITS – Intelligent Transportation System
LSCP – Landscaping
LTNG – Lighting
MISC – Miscellaneous
PVMK – Pavement Marking
RMVL – Removal of Non-Structures
RPRD – Rock Production
SGNL – Signals
SIGN – Signs
STRC – Structures
SURF – Surface Treatments

Appendix C

List of the Units of Measure in the Item Number:

A = Lump Sum

A = Foot or other measurement (Hybrid Lump Sum)

E = Each

F= Foot

J = Square Yards

K = Cubic Yards

L = Mile

M = Ton

O = LB

P = Gallons

Q = M gallons

R = Acre

T = Hour

U = Day

V = Week

W = Month

X = Year

Appendix D

The following is a list of items that need to be checked when an estimate is close to completion.

- Verify that all the bid items in the estimate match the items in the specification.
- Verify that there is a Supplemental Description for items that are used to match new bid items in the specification.
- Verify that the estimate quantities match the quantities in the specifications.
- Verify all units against the specifications.
- Check all incidental work items to make sure they are allowed in the specifications.
- Check for incidental work items which could be separated into separate bid items.
- Verify that the anticipated items have been approved.

Appendix E



Oregon

Department of Transportation
Technical Services Branch
Roadway Engineering

Interoffice Memo

January 30, 2004

To: Designers Project Leaders Transportation Design Managers Memo to Designers Manual Holders

From: s/Thomas Lauer, PE ODOT Roadway Engineer

Cc: Kathryn Ryan, Kevin Thiel, John Gernhauser - FHWA, Dale Horman - DOJ

Subject: Management of the Engineer's Estimate (EE)

PURPOSE: The purpose of this memo is to update and clarify the ODOT policy for managing the Engineer's Estimate (EE) for any public works project being awarded via the ODOT Construction Contracts Section.

SCOPE: This policy addresses the confidentiality of ODOT construction project cost estimates from initial project inception through formal project construction contract award. This policy applies to projects developed and engineered by ODOT internal staff, ODOT contracted consultants, Local Agencies and Local Agency consultants.

HISTORY: The latest written ODOT policy regarding the management of the EE appears to be a memo written by H. S. Coulter, State Highway Engineer dated December 30, 1982. Excerpting from this memo:

"The Engineer's Estimates prepared for contract bidding comparisons, federal-aid programming, etc., are to be kept strictly confidential until the low bidder has executed the contract documents."

While the referenced 1982 policy does not explicitly say it, the EE only becomes public information after formal contract award.

The FHWA addresses the management of the EE in a variety of Technical Advisories but ultimately defers policy to the individual states. However, it is clear within the aforementioned technical advisories, and in conversation with FHWA staff, that they strongly prefer keeping the EE confidential. Regardless of the FHWA preferences, a few states do include the EE with bidding documents, the majority of states keep the EE confidential until project award (like Oregon), and still others never release the EE at all.

There are many different opinions and justifications, both pro and con, for keeping the EE confidential. Regardless, Oregon has no statutory requirements that control the EE either way. Considering this fact, it is clear that the management of the EE is an ODOT Policy decision. ODOT Executive Deputy Director, John Rosenberger, has recently re-affirmed the above 1982 State Highway Engineer policy decision after receiving counsel from Drummond Kahn, ODOT Internal Audits, and Dale Hormann, DOJ.

Given the above background, the goal of the policy and procedure that follows is to communicate the expectations regarding the management of the EE now and in the future. It departs somewhat from most policy statements, in that it does not attempt to describe the relative merits of the confidentiality decision, but rather, merely tries to clarify what this decision means operationally.

POLICY:

1. THE ENGINEER'S ESTIMATE SHALL BE CONSIDERED AS INFORMATION CONFIDENTIAL TO ODOT. It is not to be shared with persons other than appropriate ODOT project development personnel, contracted consulting staff, and Local Agencies and their consultants/agents. This confidentiality shall apply during all stages of project development up to the point of formal "notice to proceed" by the ODOT Construction Contracting Section (CCS).
2. This policy applies to ALL projects being publicly bid via the CCS regardless of the method of PS&E delivery.
3. It is not ODOT's policy to voluntarily post or disclose in any form the EE after contract award to the public.
4. When requested, the release of the EE is to be managed solely by the CCS.
5. After formal contract award the EE will be made available to non-ODOT and non-Local Agency individuals and companies upon written request. This will be done on a project-by-project basis after approval to release is obtained from the CCS. In the case where a contract is not awarded, the EE shall remain confidential. In all cases only the total value of the EE will be released after written approval from the CCS. Unit prices under the EE should only be released subsequent to a freedom of information request and approval of release by both the Managers of the ODOT CCS and the ODOT Technical Services Branch.

DEFINITIONS:

1. Definitions for the purpose of the following procedure:

	Delivery Method		
	Internal ODOT (IN sourced)	External Consultant (OUT sourced)	Local Program Produced
Project Leader (PL) =	ODOT Project Team Leader	ODOT Consultant Project Manager (CPM) or ODOT Project Team Leader (PTL)	ODOT Local Agency Program Liaison (LAPL)

PROCEDURE:

1. All members of a Project Development Team (PDT) have the responsibility to maintain the confidentiality of the project estimate from project inception, through PS&E submittal and formal contract award.

2. After PS&E pre-letting submittal, but before bid opening, a Senior Estimating Engineer within the Technical Services Pre-Letting Unit will prepare the Engineers Estimate. During this process, the following rules will be adhered to:
 - a. The Project Estimate will be reviewed and refined by an ODOT Senior Estimating Engineer into the Engineer's Estimate. If the Senior Estimating Engineer needs clarification regarding any of the project parameters, he/she will contact appropriate resources. For outsourced and local program projects, all necessary communication will be routed through the Project Leader (PL).
 - b. The goal of setting the final EE is to establish an estimate that is deemed to be a “fair” value for the project to the project “owner.” The EE considers factors such as; prior bid item cost history, project difficulty and locale, expected level of competition, current market pricing trends, magnitude of the project, uniqueness of work type, etc.
 - c. The Senior Estimating Engineer will communicate the final total value of the EE via confidential e-mail to the Project Leader no later than one week prior to bid opening.
 - d. It shall be the responsibility of the PL to initiate any needed actions and/or responses to Final EE. This includes confirmation of adequate funding if the EE has increased as well as desired communication regarding significant estimate changes.
 - e. In all cases, the ODOT Final Estimator has the final say in establishing the EE.

3. Immediately after bid opening the Project Estimator will evaluate the submitted bids following the procedure outlined in the memo: "[POLICY: Bid price evaluation and recommendation](#)". The evaluator will consult with others within ODOT and/or the consultant and/or the local agency, as needed, to develop their final recommendation.
4. The final estimator's recommendation shall be communicated to the Construction Contracts Manager via the Bid evaluation template letter. This communication will contain confidential information and specifics regarding the Engineer's Estimate and the evaluation of the bidder's prices.
 - a. In the case of a recommendation to award, the CCS will normally initiate the formal award process.
 - b. In the case of a recommendation to reject the low bid, or all bids, the CCS will normally allow comment from the Region or Local Agency regarding this decision prior to making their final determination.
 - c. Detailed EE information may be provided to appropriate individuals (i.e. Project Leader, Project Manager) in the case when the Region or Local Agency is considering a rebuttal to the Estimating Unit recommendation.
5. The Bid Evaluation Letter also will contain recommendations regarding the monitoring of specific items and quantities during construction. If the bid is awarded, this information shall be forwarded by the CCS to the appropriate Project Manager for use during project construction.

POLICY Management of the Engineers Estimate1-30-04.doc