PROJECT COST ESTIMATION MANUAL

November 2015

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1.0 Introduction

The purpose of the Project Cost Estimation Manual is to provide guidance and instruction to Roadway Designers, Senior Designers and Project Managers for efficiently and consistently developing project cost estimates in the integrated Project Development (iPD) system.

This manual is intended to convey the transportation project cost estimation policy established by the Chief Road Design Engineer.

This manual provides general knowledge about transportation project cost estimation procedures and detailed knowledge on building estimates in the integrated Project Development (iPD) system. The user will find the current policy or be referred to the current policy related to a topic, as well as find comprehensive instructions for each step in the project workflow.

This manual will be updated quarterly with interim updates as needed depending on the nature of the change under consideration. All updates related to project delivery will be accommodated as soon as possible.

2.0 Project Cost Estimation Policy

The demand for transportation funds is far greater than what is available; therefore, the distribution of these funds must pass intense public scrutiny. Throughout the project development process, project cost estimates play a crucial role in the management of the department's large and complex transportation funding program. The main role of the Roadway Design Division in the project cost estimation process is to provide timely estimates of anticipated project costs to management so decisions can be made regarding the appropriation of available funding. The detailed Engineer's Estimate shall not be disclosed to the public and will be kept confidential until the end of the bid opening.

2.0.1 Project Estimating

Overview

During the planning phase and the scoping phase of project development, project estimates are risk based parametric estimates of similar work, using historical pricing. This "planning" level estimate is performed using the WIZARD estimating tool located on NDOT's website under the Transportation Planning section. The design phase requires more accurate estimation so management will have adequate information to manage the department's budget. The estimator builds the estimate in the following stages: the Engineer's Estimate, the Intermediate Review Estimate (60% plans), the QA Estimate (checking phase), the Final Engineer's Estimate (Plan, Spec & Estimate), the Preliminary Estimate (Small sets due to Administrative Services) and possibly a New Bid Item Version # Estimate if a supplemental was done that effects an estimate's unit(s) of work.

Estimating Software

Cost estimates for contracts are developed within a software program called integrated Project Development (iPD). A link to the iPD program is located on the NDOT Sharepoint home page. This program encompasses NDOT's project cost estimation as well as contract administration and contains the Project Administration, Estimate, Plans Desk, and Electronic Bids subsystems. As a means for management to track projects online, the projects shall be maintained in iPD throughout the design process. Transportation improvement projects shall be entered into the iPD system prior to the processing memo to satisfy federal participation requirements.

Methods of Measurement

The method of measuring work performed under a contract deserves serious consideration. The most common method is by unit cost, which breaks work down by quantity or time, while other methods include lump sum and force account. Lump sum is an amount the department agrees to pay the contractor for completing the prescribed work, regardless of the actual effort. Force account is paid based on the actual labor, equipment and materials needed to complete

the prescribed work plus profit and overhead. Refer to the Standard Specifications for Road and Bridge Construction for the method of measurement specific to each bid item.

Engineer's Estimated Unit Price

The engineer's unit price is the cornerstone of the project estimate. The process of establishing an estimate is subjective in nature and requires engineering judgment. The estimator must first determine the engineer's unit price for a unit of work and then adjust that price for any unusual circumstances that may apply to the project.

The estimator should enter the Item Price Setup criteria located on the Estimate Setup tab as a starting place for determining a unit price. In establishing the engineer's unit price, the estimator must be wary of comparing prices that are from other regions, are out of date, have special circumstances associated with them, have a limited database or are susceptible to significant market fluctuations. The estimator must consider factors such as economy of scale, remote project locations, proximity of material sources, special conditions and historical trends. This information can be compared by using the Item Price Lookup report and analyzing the information available in the three different report formats.

Lump sum amounts are not guesses and should always be based upon reasonable assumptions and calculations of the anticipated work. For example, contractor-furnished traffic control should be estimated in much the same manner as traffic control included in the contract plans. The estimated amount must account for labor, materials, stockpiling, transportation, special equipment, expertise and incidentals associated with installing or constructing the items of work.

Occasionally, an estimator must develop an engineer's unit of work price for work new to the department. The resulting cost must account for any materials, labor, stockpiling, transportation, special equipment, expertise, and incidentals associated with installing or constructing the items of work. The worksheet to develop this cost should be forwarded to the price checker.

When an item number is added to the estimate in the iPD system, the system will default the unit cost to a weighted average based on the criteria used in the Item Price Setup located on the Estimate Setup tab. This feature allows for the preparation of a "quick and dirty" estimate. A cursory check for the engineer's unit price of these values is necessary, and the values should be revised based on specific project conditions at the earliest opportunity.

Contingency Guidelines

During the course of a project's development, the division's level of confidence in the project data increases. This represents how much confidence management can have in project information currently available to them. The design team must keep the accuracy of the schedule and estimate compatible with the level of confidence in the project.

Preliminary Design: During preliminary design the project schedule should be based on the work breakout structure template for the appropriate project type. The schedule should be maintained using historical data from previous projects of similar nature, conversations with

major project contributors and the judgment of experienced project management professionals. A project coordinator should be able to predict the QA review submittal date to within three to six months. The design team should maintain the estimate using rough estimating techniques, the best information readily available and 15-percent for contract contingencies. The design team should always develop its own estimates and not rely on previous attempts.

Intermediate Design: During the intermediate design the schedule should be correlated with the final scope to include all remaining tasks and be maintained using man-hour estimates, detailed conversations with major project contributors and the judgment of experienced project management professionals. A project coordinator should be able to predict the QA review submittal date to within one to three months. The estimate should reflect costs for all work being contemplated and the design team should have rough calculations to back them up. There should be few, if any, lump sum "guesstimates" at this point. All items of work should be identified, the associated item numbers should be incorporated into the engineer's estimate, and the contract contingencies should be set to 10-percent.

Final Design: During final design the schedule should be based on the actual man hours needed to complete the remaining work and guaranteed delivery dates from major project contributors. A project coordinator should be able to predict the QA review submittal date to within one to three weeks. The estimate should be based on actual units of work, the associated quantities should reflect checked calculations, and contract contingencies should be set to 7-percent if the estimate is < $3 million, 5-percent if the estimate is between $3 million and $25 million and 3-percent if the estimate is > $25 million.

Engineer's Estimate

The engineer's estimate is used to manage the department's project schedule and funding through the PSAMS. The value of the engineer's estimate in managing the project costs cannot be overstated. Any changes that will have a significant effect on the project's cost must be incorporated into the engineer's estimate and reported to management in a timely manner. The designer shall create an estimate based on unit costs and maintain it in iPD throughout the design of the project.

Preliminary Estimate

When the project is ready to advertise, the estimator must begin preparing the preliminary estimate which is based on the engineer's unit prices and agreement information. The estimate is sent to Electronic Bidding System (EBS) by Specifications and Administrative Services prepares the contract for advertising.

Agreement Estimate

After the contract has been awarded, the iPD system will create the Agreement estimate. The estimator will receive a memorandum from Administrative Services stating the award information. The estimate is associated with other financial data and is augmented with descriptions and statistical information. The estimate is revised to reflect the actual prices agreed to between the department and the contractor, and is therefore called the agreement estimate.

Funding Breakouts

To capture costs associated with specific funding and reporting requirements within a contract, the estimate must provide subtotals accordingly. The USDOT is required to issue an annual report to Congress on its spending authority. To facilitate this complex task, all federal funding is broken out by specific work types and each work type that has an agreement associated with it must be in its own breakout. Similarly, NDOT must report to the Nevada State Legislature on its spending authority, so the estimate is broken out into counties to facilitate this requirement.

Most funding is allocated for specific purposes and cannot be used for any other purpose. To facilitate auditing of contracts to ensure that funds were spent appropriately, the various funding sources may need to be broken out separately. For example, state funds cannot be combined in a breakout with work being done off-system.

Since the State operates under the rules of the Governmental Accounting Standards Board (GASB), the various departments must report their assets in accordance with the guidance established under GASB-34. Through this department's efforts to build and improve transportation infrastructure, new assets are continually being added to the State's cumulative total. To facilitate the process of accounting for these increases, the department separates the project costs associated with new infrastructure from those associated with preserving or maintaining, existing infrastructure. Although the concept is simple its implementation can be complicated so it's important that the department's guidelines be used to ensure consistency.

Ancillary costs are those for which bids are not solicited, such as construction engineering, fuel escalation, asphalt escalation or incidental construction. These costs must be separated from the direct costs paid to the contractor for units of work contained in the bid proposal.

Price Check

Prior to advertising a contract, the final unit price for each work unit in the engineer's estimate must be established by a Manager 1, Professional Engineer or higher. This is important because bid proposals are scrutinized against the engineer's estimate and this can affect whether the contract is to be awarded without delay. Decisions to re-advertise, evaluating fair bidding practices and justification of unbalanced bids are all based on the benchmarks established by the engineer's estimate.

Since the manager performing the price check may not be familiar with the details and nuances of the contract, it is essential that the estimator communicate any special circumstances or relevant information to the price checker. The estimator is required to enter remarks into the iPD system using the Item Notes window for each item number that requires special consideration by the price checker. For example, a cold milling item number, measured by area, should always have a remark associated with it that informs the price checker of the nominal depth of the milling and if the millings will be disposed of on or off the project.

When establishing prices for item numbers within their purview, the manager responsible for the price check is required to obtain input from the management of other divisions and sections (i.e. Bridge, Traffic or Hydraulics). The estimator is responsible for contacting the staff of these divisions and sections to ascertain any special circumstances or relevant information for their item numbers and entering appropriate remarks into iPD. The exact procedures for processing the estimate are contained in the Estimate Building Procedures of this manual.

3.0 iPD System Design

This section provides a detailed description of the overall design, or structure, of the iPD system to help you understand what the system does and how it all works.

The Department has the responsibility to ensure project expenditures are prudent and legal. To properly manage the multi-million dollar budget of the Nevada Department of Transportation, the costs of each transportation improvement project must be estimated and tracked throughout each phase of the project. Various funding aspects must be correctly associated with the proposed work to accommodate required accounting procedures. The design team is responsible for this activity during the pre-construction engineering phase and must keep management informed of significant changes to project costs.

Once a project goes to contract, the information generated in the project cost estimate must be passed to the construction team so the actual payments can be tracked in the Integrated Financial System (IFS) while the project is being built. The Project Estimation module of the iPD program is designed to interface specific project estimate information to the IFS/CMS system. The Integrated Financial System (IFS) is the statewide accounting system that provides a seamless accounting and budgeting process throughout all of the state's departments.

3.0.1 Estimate Structure

Overview

The iPD program encompasses NDOT's project cost estimation as well as contract administration and contains the Project Administration, Cost Estimate, Plans Desk, and Electronic Bids subsystems. Project cost estimates are developed within the Project Cost Estimate subsystem. The following sections explain the main components of a cost estimate in the iPD program.

Estimate Version

An estimate changes version five times during the design process: from Engineers estimate to Intermediate estimate to QA estimate to Final Engineer's estimate to Preliminary estimate to Agreement estimate. The engineer's estimate is the department's estimate of the project costs during the development of the project and is updated monthly. The Preliminary Estimate is the department's estimate of the construction costs for the contract as advertised. The Agreement estimate is the estimate of the construction costs of the contract as awarded based on the contractor's bid prices.

Projects and Designs

A Project refers to an established transportation improvement project in the Department's annual work program, TSP-Transportation System Projects document. Each project is assigned a five-digit Project Identity number.

During the life of a project, multiple alternatives can be under consideration for which separate cost estimates must be tracked, these are considered designs in the estimate system. For example, a widening project may need to compare purchasing right-of-way for fill slopes versus constructing retaining walls. To accommodate this, multiple design alternatives can be tracked in the estimate, only one alternative can go to contract.

Breakouts

To satisfy reporting and accounting needs a project's costs are divided, or broken out, into logical categories. These breakouts allow costs to be tracked for various types of work, political sub-divisions and financial aspects. Within the system, a breakout is comprised of four components: Item Numbers, Quantities, Prices and Funding.

- Item Numbers: The Department maintains a master list of item numbers that relate to specific construction materials or activities. Each breakout consists of the item numbers necessary to accomplish the work within the breakout and any ancillary costs that are associated with the item numbers.

- Quantities: Quantities are calculated and stored in the breakout for each item number. There are several methods of quantifying work units: linear, area, volume, duration, lump sum and force account.

- Prices: A cost per unit is assigned to each item number in a breakout, however, these prices are assigned at the contract level in order to ensure that appropriate economy of scale factors are applied.

- Funding: Multiple funding sources, using various participation formulas, can be applied to a breakout. It is essential to ensure that each source is allocated correctly.

Contract

A contract refers to the legal agreement between the Department and a construction firm to whom the Department is hiring to perform work. The contract includes the plans, specifications and the estimate and can include multiple projects. The contract number is not assigned until the documents are ready to be advertised and the estimate has been sent to EBS (Electronic Bidding System).

3.0.2 System Security

Overview

The data in the project estimate module is both sensitive and crucial to project delivery at the Department. Some system security measures have been implemented in order to ensure data integrity and provide control over certain steps in the final contracting process. The data cannot be passed into final contract processing until a manager has approved the prices used to establish the Engineer's Estimate and the estimation specialist has reviewed the estimate. To revise the estimate after sending the estimate to EBS a New Bid Item Version will need to be created.

Logging on to iPD
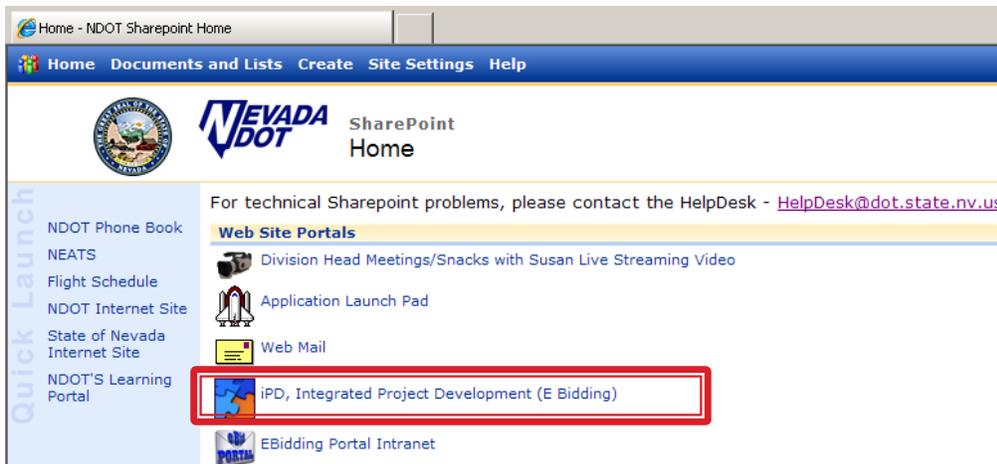
To log onto the iPD system you need to go to NDOT's Sharepoint, click the iPD icon.
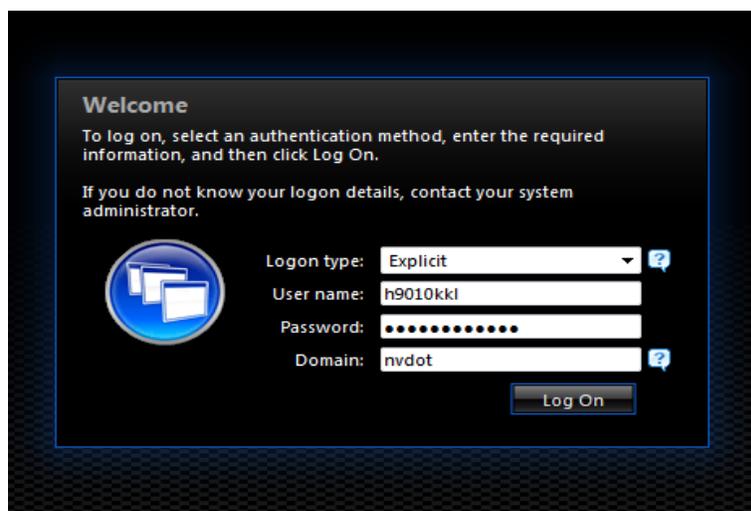
Choose Explicit from the drop down, fill in the remaining fields and click "Log On".

- User name – this is your "h9010xxx" number

- Password – same as the one you use to log on to your computer

- Domain – "nvdot"
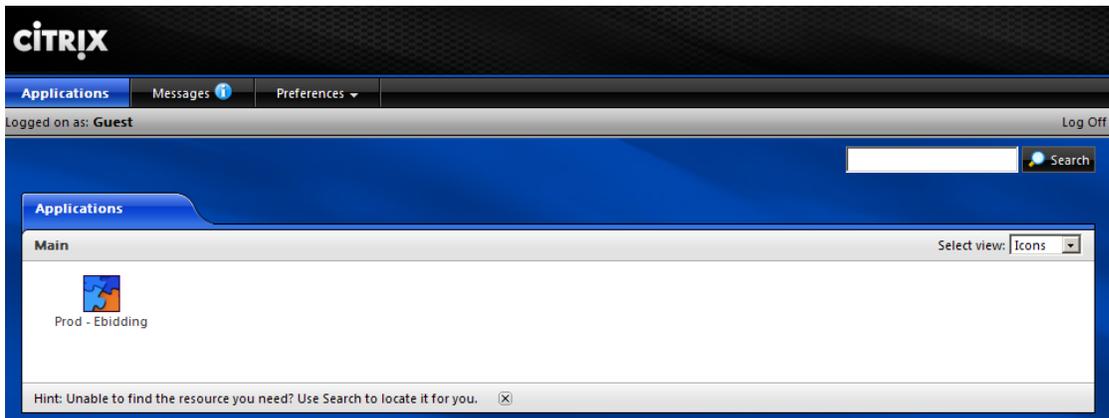
Click on Prod-Ebidding
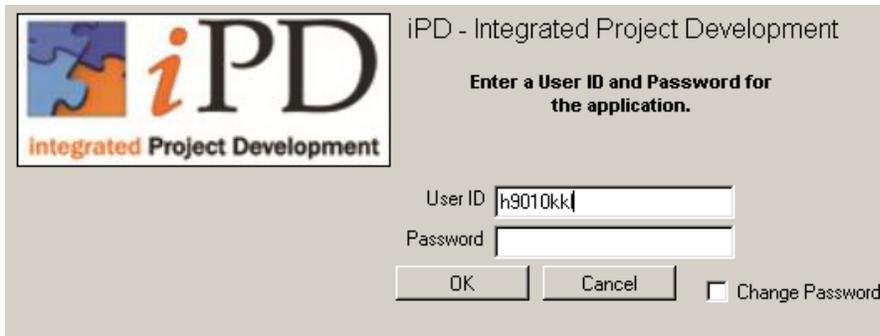
Enter – User ID – this is your "h9010xxx" number

Enter – Password – the first time use "newpass", click "OK", then the system will prompt you to change your password. Fill in the "Password" and "Confirm Password".

How do I Change my Password?
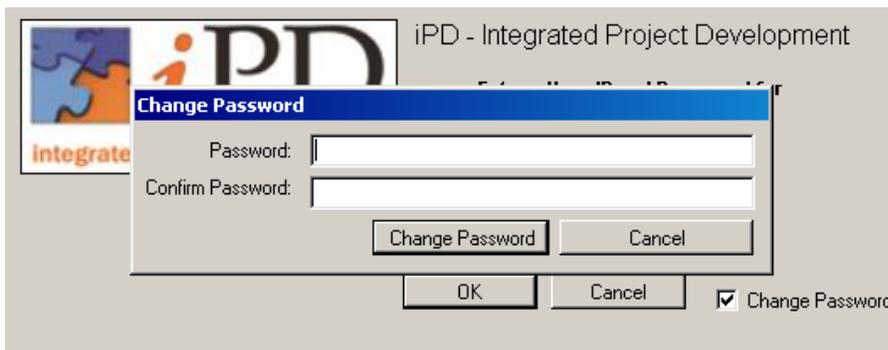
To change your password, click the check box "Change Password".

Enter the required data in the fields and click the "Change Password" button.

NOTE: NDOT only owns 60 licenses for the Citrix application, so if you are not actively working in your estimate, please "Log Off" from the Citrix application. If this symbol is on your tool bar you have not "Disconnected" from the Citrix application.

3.0.3 System Access Roles

Estimate Designers (Estimators)

The design squad members, who are generally responsible for the project estimates, are designated in the system as "Estimate Designer" (Estimators). Estimators have access to virtually every screen and view in Project Administration and Estimate subsystems. In most cases the access is limited to viewing the information only, however within the screens that are directly a part of the iPD estimation subsytem, the estimators have **add**, **copy** and **delete** permission on almost every screen.

Estimate Specifications (Specifiers)

The specifications writers, being generally responsible for the Item maintenance and coordinating the final contract documents, are designated in the system as "Estimate Specifications" (Specifiers). Specifiers have access to virtually every screen and view in the Project Administration and Estimate subsystem. In most cases the access is limited to viewing the information only, however within the Item Maintenance, the specifiers have **add**, **copy** and **delete** permission and are the only role that can unlock an estimate once it is at the Preliminary Estimate version. Also, Estimate Specifications is the only role that can send the estimate to EBS.

Price Checkers

The section managers being generally responsible for the final engineer's unit prices, are designated in the system as "Price Checker". Price checkers have access to virtually every screen and view in iPD. Price Checkers have the ability to check the "Price Checker Approval" checkbox in the Project Setup window. This approval is needed before advancing an estimate to the Preliminary version.

Estimate Checkers

The Project Estimation Specialist, being generally responsible for the project estimation module, is designated in the system as "Estimate Checker". The Project Estimation Specialist has access to virtually every screen and view in iPD. The Estimate Checkers have the ability to check the "Estimate Checked" checkbox in the Project Setup window. This approval is needed before advancing an estimate to the Preliminary version.

4.0 Estimate Building Procedures

This section provides sequential instructions for each entry screen
needed to enter a project estimate into the iPD System.

The design team is responsible for creating an estimate in iPD as one of the first steps in the project development process. Management uses these estimates to manage the department's work program and must capture costs at various levels: Contracts accumulate costs at the contract level, Project/Designs capture costs at the project level, Breakouts capture costs at the type of work and funding levels, and units of work provide costs for each pay item in the contract.

Projects are an approved transportation improvement with a definite beginning and ending point, although, for certain projects, such as signal systems, the beginning and ending points are the same. For each project, there may be alternate approaches to accomplishing the purpose of the project; in iPD these alternatives are called Design Alternatives.

The system is designed to create Project/Designs and then associate them together by having a Master Project with Associated Projects. There can be up to seven Associated Projects to a Master that can go out as one Contract.

Once a Project/Design is created then Breakouts can be created and Units of Work added to them. The basic workflow for the process of an estimate is illustrated in the following diagram:
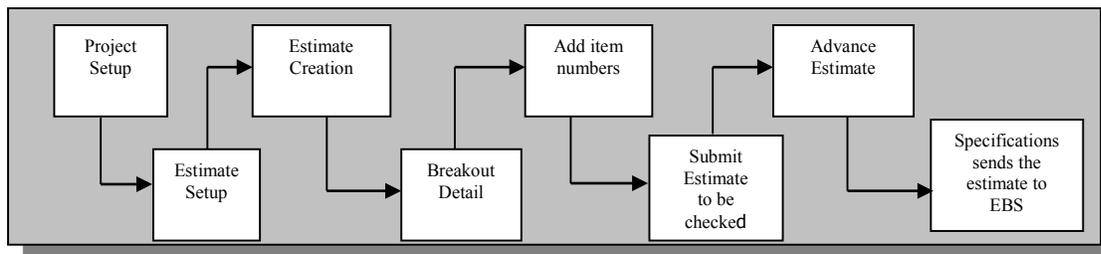
4.0.1 Creating a Project

Overview

All estimates in iPD must be based on an approved project so you need to start with the Project Identity Number (PIN) that was established when the project was programmed. The Financial Management Division maintains the project identities in the *Project Setup window* and you cannot create an estimate for a project until they have created a record for it there.

Creating a Project
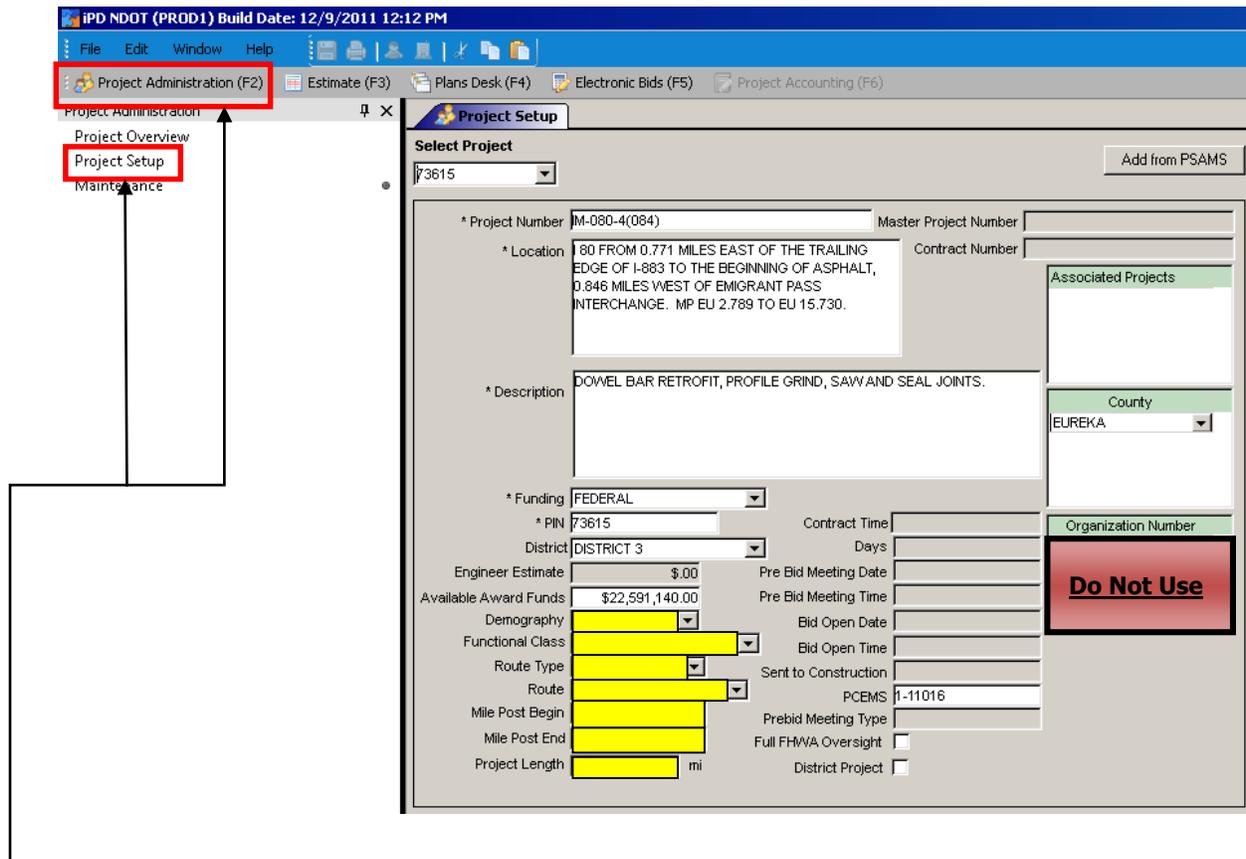
Select the Project Administration subsystem, then Project Setup in the tree view.

The project setup is used to store general information associated with the project such as its location and description. The screen print shows how your project will look when you select your project from the drop-down menu. You will need to complete the following fields (see highlighted fields above) –

- **Demography:** Drop-down field, choose Urban or Rural

- **Functional Class:** Drop-down field, refer to the program papers or Category 2 field in PSAMS Dashboard – NDOT Project Status

- **Route Type:** Drop-down field, choose the appropriate one for your project

- **Route:** Drop-down field, choose the appropriate one for your project

- **Mile Post Begin:** Free-form text, refer to the program papers

- **Mile Post End:** Free-form text, refer to the program papers

- **Project Length:** Free-form text, refer to the program papers

Note: If you have more than one county for your project you will need to add the additional one(s) in the county field. Right-click in the field, choose "Add" then select a county from the drop-down. Repeat until you have all counties for your project.

Save your estimate once you have completed the above fields.

5.0 Creating an Engineer's Estimate
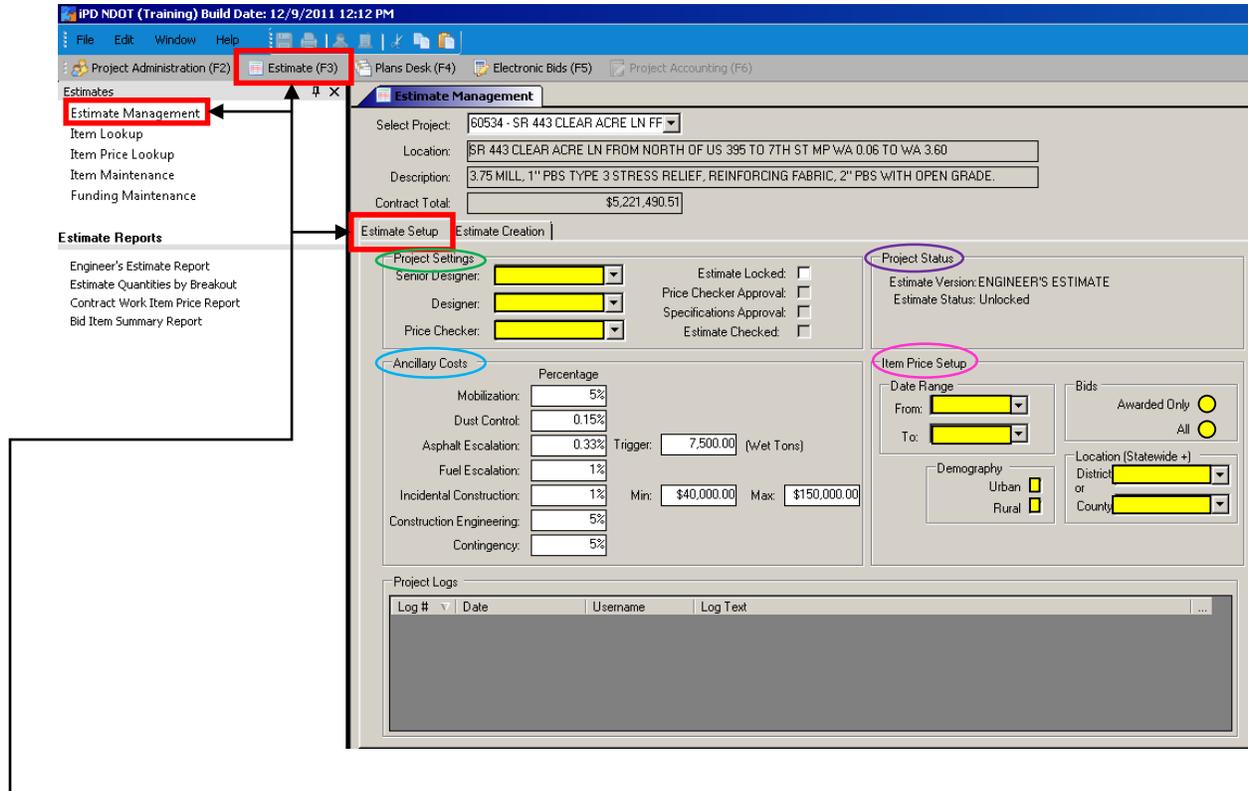
Select the Estimate subsystem, then Estimate Management in the tree view and the Estimate Setup window will be displayed.

The estimate setup is used to enter some of the project team and Item Price Lookup information. The ancillary costs are displayed with the default information found in the Table of Ancillary cost Requirements. The screen print shows how your project will look when you select your project from the drop-down menu. You will need to complete the following fields (see highlighted fields above) –

Project Settings

- **Senior Designer:** Drop-down field, choose the team member
- **Designer:** Drop-down field, choose the team member
- **Price Checker:** Drop-down field, choose the team member

Within this section are the Estimate Locked, Price Checker Approval, Specifications Approval, and Estimate Checked. The "Estimate Designer" has the ability to lock or unlock the estimate until the Preliminary Estimate version. Once an estimate has been advanced to the Preliminary Estimate version, "Estimate Specifications" is the only role that can unlock the estimate.

Project Status

This is an informational only section and lists the current Estimate Version and the current Estimate Status.

Ancillary Costs

This section contains the ancillary costs for the project. The system uses the Table of Ancillary Cost Requirements for the default, but these can be modified to accommodate special circumstances for the project. If the default information is modified, enter a log in the Project Log explaining why a change is needed and who requested the change.

Table of Ancillary Cost Requirements			
Work Unit	**Description**	**Required:**	**Dollar Value on Breakouts**
628 0120	Mobilization	On most contractor breakouts – construction bid item	6% of breakout sub-total
637 0110	Temporary Pollution Control	On most contractor breakouts - construction bid item	No impact projects - $500 Low impact projects - $5,000 Medium impact projects – contact hydraulics High impact – pollution control work units from hydraulics
637 0190	Dust Control (Do not put in work types STPL, ADJC or Y080)	On most contractor breakouts – construction bid item	0.15% of breakout sub-total
736 0020	Partnering	Required on every contract	Amount determined by Construction; put in main project, main breakout
734 0230	Contingencies	On all contractor breakouts	15% before PDFS; 10% after PDFS; 7% if Est. < $3M, 5% if Est. $3M to $25M, 3% if Est. > $25M at Preliminary Estimate

Table of Ancillary Cost Requirements			
734 0103	Construction Engineering by State Forces	On all contractor breakouts	5% - Normal Projects over $7M 5% City Force Account, Signal & Lighting, & Roadside development 7% - Overlays with <25% of safety or Minor Safety Contracts, 10% - Normal project $4M-7M 10% Overlay w/Safety>=25% or Major Safety 15% - Normal projects <$4M
734 0113	Construction Engineering by Consultants	When applicable	Amount determined by Construction, Agreement required
736 0013	Asphalt Escalation	When asphalt plan quantity is ≥ 7500 wet tons	.33% of costs for paving asphalts
736 0016	Fuel Escalation (Do not put in work types STPL, ADJC or Y080)	On most contractor breakouts	1% of breakout sub-total
736 0040	Incidental Construction (Do not put in work types STPL, ADJC or Y080)	On every contract; On most contractor breakouts	1% of contract bid price, $40,000 min. up to $150,000 max.
736 0043	Incentive Payment (Performance)	When requested by Construction	Amount determined by Construction
736 0033	Ride Incentive / Disincentive (Performance)	When requested by Construction	$1,680 multiplied by lane mile

Mobilization (628 0120)

Mobilization is the cost incurred by the contractor to mobilize the labor and equipment necessary to perform the terms of the contract and is bid on by the contractor. The department

normally uses six percent of the cost of the other contracted work to calculate this amount for the engineer's estimate. Once the winning contractor's bid price is known, mobilization is converted to a lump sum quantity by the system.

Temporary Pollution (637 0110)

The department provides payment to contractors for the work needed to meet the environmental standards for air and water pollution created during the construction of a project. The designer should contact hydraulics or refer to the **"NDOT Water Quality Manuals: Planning and Design Guide"**, Section 2, pages 2-14, Table 2-6 for the current policies and procedures to determine the impact on a project. This item # will need to be manually added in the main breakout.

Dust Control (637 0190)

Dust control is bid on by the contractor. The percentage method is used so the dust control amount is kept current automatically as the estimate evolves during the development of the project. Once the winning contractor's bid price is known, dust control is converted to a lump sum quantity by the system. The system does not add Dust Control to breakouts with a Bridge work type. Dust control for the Bridge work is covered under the breakout with a Roadway work type. If the Project contains only breakouts with Bridge work types, Dust Control will need to be added to each of them manually.

Partnering (736 0020)

All contracts should include the item # for partnering (736 0020) in order to reserve the funding needed to pay for the associated costs. The constructability section will estimate the cost for this and provide it to you when they give you working days, liquidated damages, etc. **The item # should be added to the main project in the main breakout if there is more than one project.**

Contingencies (734 0230)

Contingencies are costs that arise from conditions or circumstances that were unforeseen during the pre-construction engineering phase. The Table of Ancillary Cost Requirements provides guidance on the appropriate percentage to use based on the project's level of development. This percentage will need to be manually adjusted to comply with the guidelines. Contingency funds are used when a change order is processed on a contract.

The contingency work unit is also used to account for anticipated but undetermined costs in early estimates. In the early stages of the estimate, the percentage allotted for contingencies is higher, as an allowance for the cost of general areas of work such as traffic control, storm drainage, landscaping, and sound walls.

Construction Engineering (734 0103)

Construction Engineering is the cost incurred by the state to enforce the terms of the contract during construction by the construction resident engineer and crew to oversee the contractor's operation. Any breakout that will require the resident engineer to perform any kind of work, such as documentation or inspection, will have construction engineering calculated on that breakout construction item total.

Construction Engineering by Consultants (734 0113)

The department may hire a consultant construction engineer to perform the job of the resident engineer and crew. An agreement is needed if a consultant will be performing this duty and enter the agreement number field in the breakout detail window.

Asphalt Escalation (736 0013)

Asphalt Escalation provides funds to allow for increase in market fluctuations in the cost of crude oil. A contractor may be entitled to additional compensation if a significant increase in oil prices occurs between the time bids are received and the time the oil-based products for the contract are procured. The contractor may be required to reimburse the department if there is a significant decrease in oil prices during the same period.

Asphalt escalation does not apply to emulsified and liquid asphalts.

The construction division issues a memo to specifications just prior to advertising the contract detailing certain contract provisions. That memo has precedence over the trigger amounts in determining whether or not to include asphalt escalation.

Note: The system puts Asphalt Escalation in all breakouts. If the breakout does not contain a qualifying asphalt item the extended price will be $0.00. You will need to delete this line item before advancing to the Preliminary estimate version.

Fuel Escalation (736 0016)

Fuel Escalation provides funds to allow for increase in market fluctuations in the cost of fuel. A contractor may be entitled to additional compensation if a significant increase in fuel prices occurs between the time bids are received and the time the fuel for the contract is procured. The contractor may be required to reimburse the department if there is a significant decrease in fuel prices during the same period.

The construction division issues a memo to specifications just prior to advertising the contract detailing certain contract provisions. That memo has precedence over the trigger amounts in determining whether or not to include fuel escalation.

Incidental Construction (736 0040)

Incidental Construction costs are those associated with additional work performed at the discretion of the resident engineer through letters of authorization. The department allocates

a minimum of $40,000 to a maximum of $150,000 to each contract to enable the resident engineer to make project improvements that become apparent during the construction phase. The resident engineer is limited to spending this money at $10,000 per incident.

Item Price Setup

- ***Date Range From***: Calendar pull-down or type in the information (recommend three to four years prior)

- ***Date Range To***: Calendar pull-down or type in the information

- ***Demography***: Drop-down field, choose urban or rural

- ***Bids:*** Radio button, choose "awarded only" or "all" (recommend using "all")

- ***Location:*** choose the district or county the project is located in (recommend using the district filter)

Project Logs

The system creates a log when the estimate is locked/unlocked, advanced to the next version and when the checks are done on the estimate. The system will create a Log #, list the date of the log, show the name of the user that created the log and the type of event that generated the log. A manual log can be entered by the user by right-clicking in the field and choosing "Add".
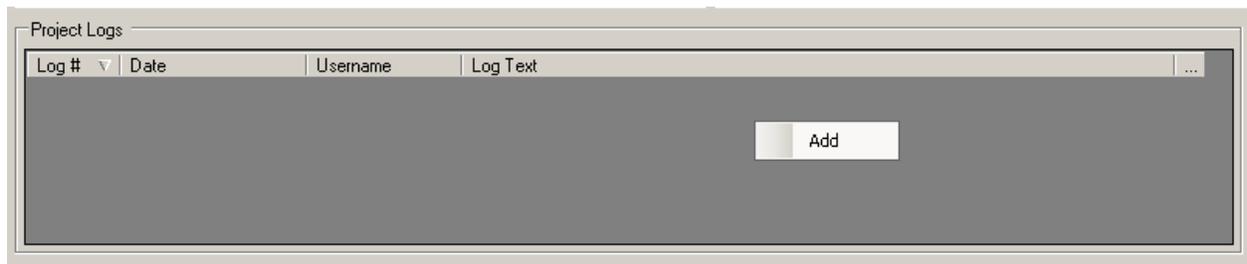
Save your estimate once you have completed a project log.

5.0.1 Creating the Breakouts in a Project

Overview

A breakout consists of two components, the breakout detail and funding information. The breakout detail contains general breakout information such as the breakout type, description of work being done in the breakout, work type code, the station limits and the county. The

funding information contains the funding codes, matching fund codes, and dollar amounts to balance the breakout.

Create a Breakout

The importance of how tax money is expended should be somewhat obvious but the level of detail at which spending is scrutinized may not be. In order to track the expenditures of transportation funds, the estimates must be broken down and reported in finer detail than just the project level. The breakout detail stores information necessary to identify spending categories and reporting requirements associated with the various funding sources.

If a project covers more than one county or more than one route, a breakout for each county and route will need to be created. For example, the project is US 50 in Churchill & Lander County and SR 121 in Churchill County, the estimate would have a breakout for US 50 CH, US 50 LA and SR 121 CH at a minimum.

Select the Estimate Creation tab, then right click on the Design Alternate 1 in the tree view and then select Add Breakout and the Breakout Detail window will be displayed. Only the first 5 fields are required before clicking "OK", but for good housekeeping complete all the fields that you can. Before you can advance your estimate to the Preliminary version ALL fields will be required to be completed.

- **Breakout Type**: Choose from the drop-down menu

    o **Contractor**: work the state's contractor is being paid to do

    o **Other:** State Forces Pavement Marking or Railroad Flagging/Inspection

    o **Utility:** work being done by the Utility company's contractor and they have prior rights

    o **Construction Engineering (State Forces):** generated by the system

    o **Construction Engineering (Consultant):** need to add bid item and amount, and there should be an agreement for the work being done

    o **Preliminary Engineering (State Forces or Consultant):** need to add bid item and amount, if using a Consultant there should be an agreement for the work they will be doing

    o **Right-of-Way Engineering (State Forces or Consultant):** need to add bid item and amount, if using a Consultant there should be an agreement for the work they will be doing

- **Description**: Describe the work being done in the breakout be as specific as possible for each breakout such as "2" PBS overlay w/OG wearing course; includes slope flattening and 100% traffic control". (max of 100 characters)

- **Work Type**: Choose from the drop-down menu (multiple work types are listed, choose the one that applies to the work being done in the breakout) see Work Classification Codes for more information

- **GASB**: Choose from the drop down-menu – New, Existing, Combined, Other, & Blank (what applies to your breakout according to the guidelines)

- **Phase**: Choose from the drop down-menu – C1-C, C2-C, & C3-C

Breakout Type	Phase
Construction with state funds	C1-C
Construction with federal funds	C2-C
Construction with other funds	C3-C
Preliminary Engineering	E1-P
Right-of-Way Engineering	E1-R
Construction Engineering	CE-N

- **Activity**: Choose from the drop-down menu – 1490, 9490, 9512, or 9187

- 1490 – federal funding

- 9490 – state funding or other funding

- 9512 – stockpile

- 9187 – Betterments/District projects

- *Agreement #:* when applicable, and include the name of the entity and if they have prior or non-prior right in the Description field

- *Organization*: Choose from the drop-down menu (Design will select **C040** on behalf of Construction Administration. If it is a Betterment/District project use the organization number for that district administration office.)

- *Breakout County*: This field is filled in by the Project Setup window

- *Breakout Stationing*: Fill in the beginning and the ending stationing or milepost if stationing is not available

Enter Funding Information

Right-click in the gray area at the bottom of the screen and choose Add

- *County*: Will be the first county listed in the breakout County field, change if not correct

- *Funding Code*: Choose from the drop-down menu – Program Papers will provide this information, but will be labeled "APPN. CODE" (if 100% state funded E10 is used)

- *Match Code*: Choose from the drop-down menu – only used if primary funding is not 100% (if it is state match funding E11 is used)

- *Total Amount*: Enter the Total Unfunded amount shown at the bottom of the screen or the amount for that Appn. Code, until you have the breakout balanced (until you have entered bid items, quantities, and unit prices this amount will be zero, so enter at least a $1.00 as a place holder or the system will give you an error message)

- Click "OK" to save the funding information in the Breakout Detail screen

Note: The Construction Engineering breakout will need a funding line for each of the funding appropriation codes used to fund the project. If there are multiple counties for the project the breakout should also have a separate line for each county. The Engineer's Estimate report has a page that lists all of the numbered breakouts, reference this page for the amount needed to fund each county.

Add Units of Work

The contract quantities for all units of work are based on the levels of accuracy in the "Quantity Precision Guidelines", see the Road Design Division 2010 Design Guide. To arrive at the amount used for the contract total, the quantities for specific locations are calculated at the level of accuracy listed in the "Precision" column.

Select the breakout in the tree view to add item numbers to, right-click in the gray area and select "Add Item(s)", this will launch the Item Lookup Window.
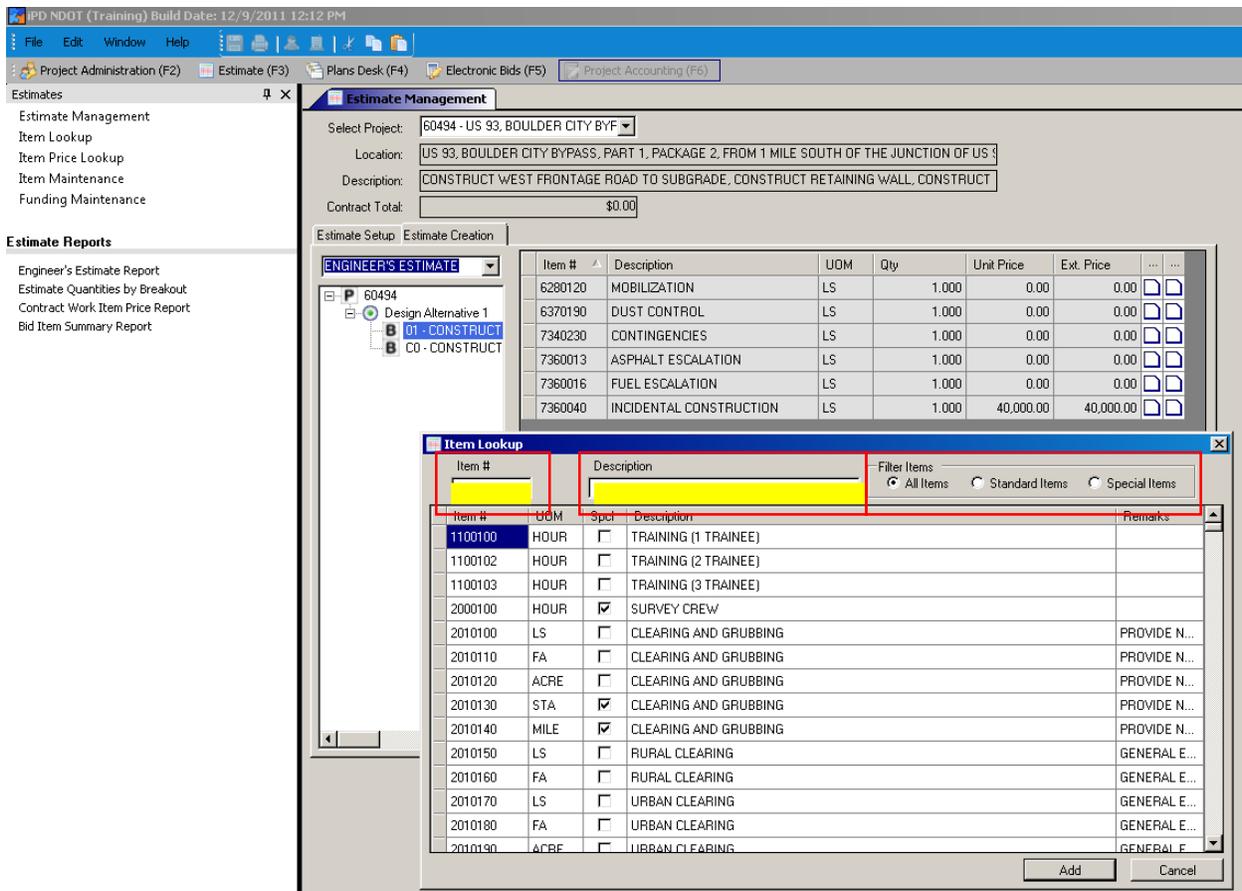
The "Add Item(s)" window is composed of three methods to search for or filter the items in the system. The methods that are used to search for or filter the table are:

- **Item #:** Free-form text field, search ahead filtering on item numbers in the item list

- **Description:** Free-form text field, search ahead filtering on item descriptions in the item list

- **All/Standard/Special Item:** Radio button, displays the items by filter choice

Find the desired item in the Item Lookup window by one of the following;

- Type in the item number in the "Item #" field (it has look-ahead capabilities and will jump to the first item number that matches your entry)

- Type in the item description in the "Description" field (it has look-ahead capabilities and will jump to the first item description that matches your entry)

Select the item by clicking on the row (clicking the item again will unselect it). Multiple items can be added at one time. Once you have selected your items click the "Add" button at the bottom of the window. A weighted average price will populate the "Unit Price" if there is

historical price information for that item #, you can modify or add a "Unit Price" manually. Then enter a quantity for the item #.

Save your estimate often.

Notes:

- The first time an item is added to an estimate the price is the weighted average price as set up in the Item Price Setup section of the Estimate Setup Tab.

- If the same item is added to a different breakout the price will be the price already selected for the item in the previous breakout.

- If the price for an item is changed in one breakout, the price for that item will be changed in all breakouts it is used in.

Conclusion

Now that you have a basic engineer's estimate in the system you need to check the reasonableness of the data; one small data entry error can cause a huge error in terms of dollars. The following chapters provide information for refining and processing the estimate.

6.0 GASB-34 Guidelines

Overview

GASB-34 (Governmental Accounting Standards Board Statement 34). In order to comply with GASB-34 requirements the department elected to use a cumulative approach for reporting its assets. In this method a baseline amount is established at a particular point in time and then the amount is increased annually by the costs of any added assets. This method eliminates the need to periodically inventory and/or depreciate existing assets.

6.0.1 Breakout categories

To accommodate asset reporting, costs must be broken out into one of five categories: [a] New, [b] Existing, [c] Combined, [d] Other or [e] Blank:

a. The "New" category is for those costs associated with adding infrastructure that has not been previously included in the State's inventory of assets. This category includes new roads, widened roadway sections, new storm drains, new bridges, new sidewalks, new bike paths, new landscaping, new traffic signals, etc.

b. The "Existing" category is for those costs associated with preserving, upgrading or maintaining infrastructure that has been previously included in the State's inventory of assets. This category includes roadway overlays, guardrail replacement, bridge replacement, safety hardware upgrades, relocation of signal lights, etc.

c. The "Combined" category is for those costs associated with any item number that would have appeared in the "New" and "Existing" selections simultaneously. The designer would put a percentage of "New" & percentage of "Existing" in the Description window along with the description of the work being done in that specific breakout. At the end of the project, Project Accounting will apply the percentage to the final total for accounting purposes.

d. The "Other" category is for those costs associated with infrastructure not owned by the State such as those owned by a private enterprise (i.e. adjust covers owned by utility companies) and local governments.

e. The "Blank" category is for those costs not associated with infrastructure such as engineering costs like construction engineering, preliminary engineering, and right-of-way engineering.

6.0.2 Reporting Thresholds

There are two cost based thresholds associated with GASB-34 reporting requirements, a project threshold and a design feature threshold. There is some consideration that should be given to applying these thresholds when the costs are close to the threshold amount. Since

the costs are based on the final contract costs, the award prices are generally what will determine whether or not the threshold has been reached. It is therefore prudent to go ahead and breakout any project or design feature that has an estimated cost close to its threshold.

Project Threshold

This threshold provides for accounting all project costs as "Existing" if the total cost of the project is under $500,000.00 even if most of the improvements are new. This is convenient for small projects like isolated ITS installations and district projects.

Design Feature Threshold

The second threshold provides for accounting the cost of a new design feature as "Existing" if the total cost for the feature is under $10,000.00. An example of using this threshold appropriately is new stop signs added as part of an overlay project. Although the stop signs constitute infrastructure that had not been previously included in the State's inventory of assets, if the cost is estimated to be under the $10,000.00 threshold they can be included with the "Existing" work.

6.0.3 New-Existing Interfaces

A tricky area of determining the appropriate category for improvements is at the interface between existing and new infrastructure such as encountered when widening a roadway. In such cases some of the existing infrastructure normally needs to be removed in order to create a suitable connection. Technically, any material used to replace infrastructure that was removed for this purpose should be considered existing but that creates too much of a burden. Instead, a rule has been adopted for this situation that allows all the widening material, including that for replacing the removals, to be coded as "New". The apparent exception to this is that when a unit component, such as a culvert end treatment, is perpetuated, then it is coded as "Existing" regardless of whether the old one was re-used or replaced with a new one.

6.0.4 Special Cases

1. The entire cost of re-striping a roadway to make more lanes is coded as a % of "New" since the road can now carry more traffic. This may seem contrary to the examples given below in that a portion of the striping is not considered as a replacement cost and coded as existing. So in the case of a four lane road that is overlaid and then striped as a six lane road, the striping costs are coded as a % of "New" and the paving costs as a % of "Existing".

2. If something is built to replace an existing feature but the original feature remains in public service for another purpose, then the constructed feature should be coded as a % of "New". So in the case of a bridge structure over a river that cannot handle the vehicle loads of a planned development and: [a] a new structure is built adjacent to the existing structure, [b] the road is realigned to the new structure and

[c] the old structure is turned over to the county for use as a shared use path; all costs for the bridge structure are coded as a % of "New" and the associated roadwork is coded as a % of "Existing".

6.0.5 Example Cases

3. A project to widen a four lane road to a six lane road will also include a full width overlay of the existing roadway surface. Among other things, this will require extending existing cross drains and relocating the longitudinal traffic barriers and roadside signs to accommodate the widening. The work coded as a % of "Existing" would include: [a] removal of any existing materials, [b] any signs, longitudinal traffic barriers and culvert end treatments that are being perpetuated from the previous roadside. The work coded as a % of "New" would include: [a] the earthwork and structural section improvements beyond the trench line, [b] the cross drain extensions, and [c] any signs, longitudinal traffic barriers and culvert end treatments that are not a perpetuation from the previous roadside. In the breakout detail, the designer would put a percentage of New & percentage of Existing in the Description window along with the description of the breakout. At the end of the project, Accounting will apply the percentage to the final total for accounting purposes.

4. An existing interchange area is landscaped for the first time to improve the aesthetics. The landscaping is considered a new asset and so the cost is coded as a % of "New", even though traffic capacity is not added to the transportation system.

5. An existing interchange area is completely re-landscaped to improve the aesthetics. All of the existing material, including the irrigation system, is removed before installing the new material. The removal of existing material is coded as a % of "Existing"; the material replacing the existing and new material is coded as a % of "New".

6. Five new dynamic message boards are added to a freeway system. The dynamic message boards are new assets so the cost is coded as a % of "New", even though traffic capacity is not directly added to the transportation system. The same is true for overhead sign structures and other similar features. If they are a new installation, and not a replacement, then they are coded as a % of "New".

7. An at-grade intersection is replaced with an interchange. Even though new lanes are not added to either road, the improvement will accommodate more traffic flow so the cost is coded as a % of "New" however the cost of removing the existing infrastructure to accommodate the interchange is coded as a % of "Existing".

8. An existing run of guardrail is removed and replaced with concrete barrier rail. Since the concrete barrier is replacing an existing system, the cost is coded as a % of "Existing".

9. An existing run of guardrail is extended two hundred feet to bring the feature into compliance with current safety criteria. The cost of the new guardrail is coded as a % of "New" but any work on the existing guardrail, such as removing the end terminal to accommodate the extension, is coded as "Existing". If a new end terminal were installed on the end of the guardrail extension, it would be coded as a % of "Existing" since there was an end terminal on the existing guardrail.

10. Steel offset blocks are replaced on existing guardrail runs to bring the systems into conformance with current safety criteria. The cost is coded as a % of "Existing".

11. An emergency escape ramp is constructed for runaway trucks. The improvement is coded as a % of "New" however the cost of removing the existing infrastructure to accommodate the escape ramp is coded as a % of "Existing". The same is true for truck climbing lanes and weight inspection stations. However, if an existing such facility were relocated, the work would all be coded as a % of "Existing".

12. A bridge structure over a river has reached the end of its service life so: [a] a new structure of the same general dimensions is built adjacent to the existing structure, [b] the road is realigned to the new structure and [c] the old structure and its associated road alignment are obliterated. All costs are coded as a % of "Existing". If, however, any widening were included in the project, such as for sidewalks, shoulders or increased travel lanes, then the associated costs would be coded as a % of "New". The work units coded as "New" would include: [a] any work unit, such as sidewalk, that did not previously exist; and the work coded as a % of "Existing" would include the paving work units. The designer would put a percentage of New & percentage of Existing in the Related Data window along with the description of the project. At the end of the project, Accounting will apply the percentage to the final total for accounting purposes.

13. A new pedestrian crossing signal is installed near a school to provide the children a safe method for crossing a busy urban arterial. Since the total project cost is less than $500,000.00, the project is coded as a % of "Existing".

14. A rural state route is scheduled for a preservation project and due to development in the area the ADT has gone from 400 to over 4000 since the previous contract. The structural design is beefed up to handle the increased traffic so, instead of the originally proposed 2-inch overlay, the contract goes out with a 2-inch mill and 4-inch dense grade section of improvement. Although it may seem that a portion of the structural section improvements should be coded as a % of "New" all the improvements should actually be coded as a % of "Existing". Even though the number of vehicles traveling on the road increased, only the ability of the road to hold up better under the higher loadings has been changed.

15. A city street is cold milled and repaved. There are many utility covers to be adjusted and they are owned by various utility companies. Each utility company will be in its own breakout and the GASB-34 coding would be "Other" for each breakout.

7.0 Refine Estimates

This chapter guides you through the process of modifying an estimate to match the particular aspects of the project.

7.0.1 Price Remarks

Estimators must provide project managers with special information relevant to the costs of the various units of work. Any non-standard unit of work, or non-standard use of a standard unit of work, requires a price remark. The nature of some standard units of work, such as lump sum or cold milling, always require that a remark be provided. The project manager may not be familiar with the details of every contract within their section and therefore must rely on this information when establishing the engineer's estimated prices.
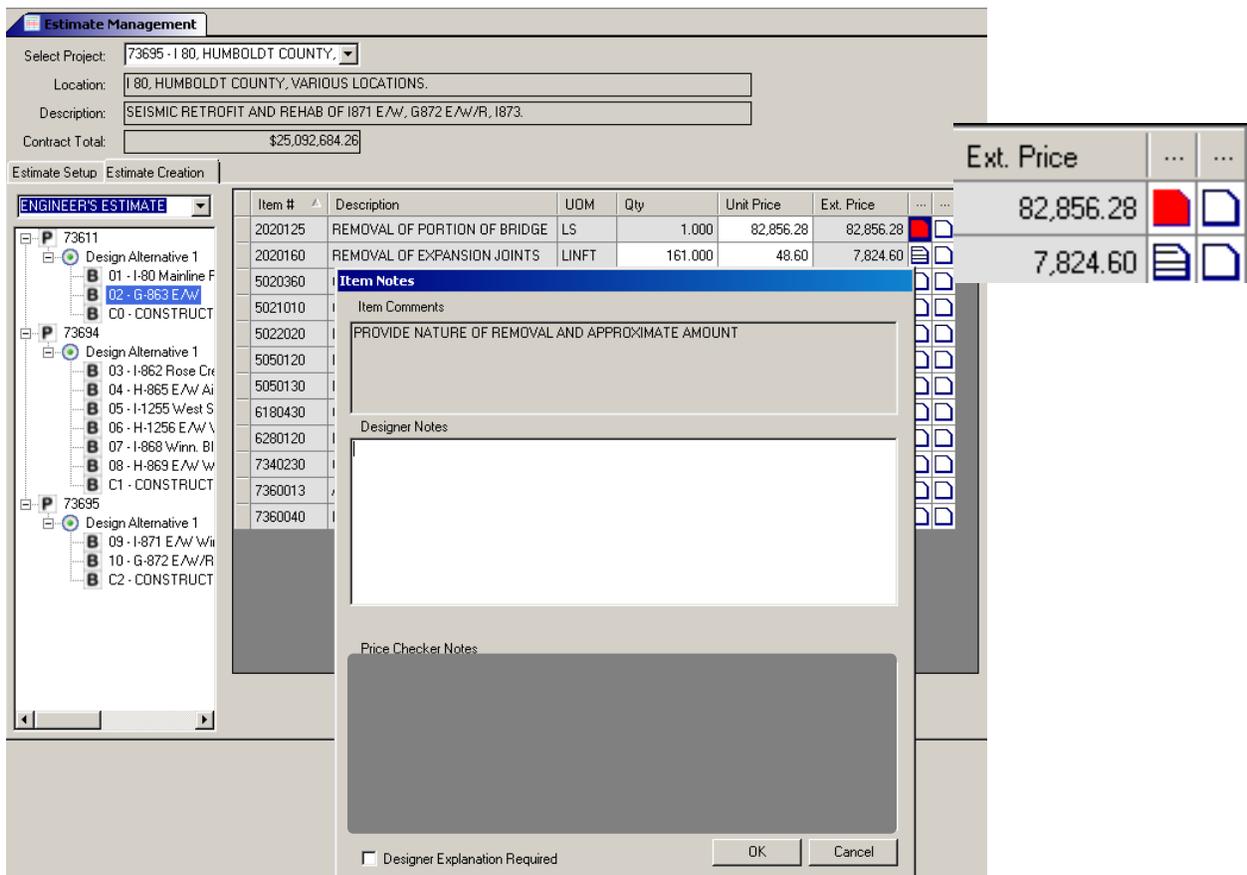
Click on the red page and the "Item Notes" window will open. The Item Comments lists the information that is required. Enter the item information in the Designer Notes field.

The system has edits that require certain work units to have an Item Note entered in *the "Item Notes" window in the Designer Notes field* before the **Prices Checked** indicator can be set and/or the **Estimate Phase** can be changed to preliminary. The work units that require a remark will have a red page in the column next to the Ext. Price. Once a remark has been filled in, click "OK". The red page will then turn white with lines across it. Any item can have a remark if it would help explain the unit price or how the item will be used, but the ones that are red require a comment.

Required Price Remark Work Units		
IWOK	**Description**	**Unit**
	Information required by price checker.	
Varies	All lump sum work units	LS
	General extent and nature of work.	
Varies	All force account work units	FA
	General extent and nature of work.	
2020105	Removal of bridge	EACH
	Deck area and type of bridge materials	
2020255	Removal of RCB culvert	EACH
	Box dimensions; depth below profile grade; length of removal.	
2020160	Removal of expansion joints	LINFT
	Type of joint.	
2020565	Removal of retaining wall	LINFT
	Height of wall; type of wall material.	
2020335	Remove reinforced concrete pavement	SQYD
	Depth of removal; disposal requirements.	
2020340	Removal of concrete pavement	SQYD
	Depth of removal; disposal requirements.	
2020345	Remove concrete surface (cold milling)	SQYD
	Depth of removal; disposal requirements.	
2020965	Removal of bituminous surface	SQYD
	Type of removal; disposal requirements.	
2020990	Removal of bituminous surface (cold milling)	SQYD
	Depth of removal; disposal requirements.	
2030600	Trenching	STA
	Width and depth of trenching; disposal requirements.	
2030610	Trenching	MILE
	Width and depth of trenching; disposal requirements.	
2030620	Trenching	SQYD
	Depth of trenching; disposal requirements.	
2060110	Structure excavation	CUYD
	Shoring requirements.	

Required Price Remark Work Units		
IWOK	**Description**	**Unit**
	Information required by price checker.	
5020530	Laminated elastomeric bearing pad	EACH
	Pad dimensions.	
5020540	Plain elastomeric bearing pad	EACH
	Pad dimensions.	
5020650	Grind concrete deck slab	SQFT
	Depth of grinding.	
5021860	Asphalt plug expansion joint	LINFT
	Depth of joint.	
5060400	Steel jacket	EACH
	Weight of steel	
6090790	Dissolved air flotation system	EACH
	Type of system	
6231570	Temporary lighting fixture	EACH
	Type of lighting fixture	
6400260	Sound barrier wall	SQFT
	Type of wall material.	

Enter the price check remark; be as specific as possible such as "Includes structure excavation and backfill".

7.0.2 Associated Agreements

If you have a 3rd party agreement associated with a project, it must be entered in the breakout detail window and each agreement must have a separate breakout. Agreements can be found on Sharepoint, in Administrative Services Divisions link. Click on Agreement services on the right side, then on the left side, click on Active scanned agreements. C030 Right of way is where the agreements for utility companies are found. The cooperative agreement with a local agency a copy of the agreement can be found in C015 Project Management or C010 Design's folder.

7.0.3 Special Work Units / Breakouts

Overview

Some work that has a 3rd party agreement number associated with it and other specified work require their own breakout along with some special work units. These work units may require special logic in the system's program code or other considerations. Special Work Units table provides an index of special work units, the breakout types and the work types to which they may apply.

Special Work Units			
Work Unit	**Description**	**Breakout Type [1]**	**Work Type**
110 series: Training			
110 0050	Training	C	Y080
408 series: Maintenance Stockpile			
408 0624	Screenings, 3/8 Inch (In Stockpile)	C	STPL
408 0644	Screenings, 1/2 Inch (In Stockpile)	C	STPL
609 series: Adjustment of utility covers (Owned and Paid by utility co.)			
609 0570	Adjusting covers (special)	C	ADJC [2]
609 0250	Adjusting manhole covers (method A)	C	ADJC [2]
609 0260	Adjusting manhole covers (method B)	C	ADJC [2]
609 0270	Adjusting manhole covers (method C)	C	ADJC [2]
609 0590	Adjusting valve covers (method A)	C	ADJC [2]
609 0600	Adjusting valve covers (method B)	C	ADJC [2]
609 0610	Adjusting valve covers (method C)	C	ADJC [2]
734 series: Work performed by agency other than contractor paid by NDOT			
734 0215	In kind services((work by owner)	O	I000
734 0218	Utility adjustment (work by owner)	U	Y060
734 0224	Railroad flagging and inspection	O	I000
734 0221	Utility flagging and inspection	U	I000
734 0227	Railroad construction	O	I000
736 series: Payment for performance specifications			
736 0043	Incentive payment	C	I000
736 0033	Ride incentive/disincentive	C	I000
736 0060	Disputes review board	C	I000
[1.] C = Contractor; U = Utility by owner; O = Other [2.] Only used on breakouts with infrastructure owned and paid for by others.			

Training (110 0050)

The contract compliance officer in the Construction Division may require the contractor to hire trainees. Since a unique work type (Y080) is used to track the costs associated with this requirement, the above item #'s are used in this breakout. The GASB selection should correspond with the "New", "Existing", or "Combined" selection in the main breakout. You cannot have a training breakout when you have bridge funding. The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

Maintenance Stockpiles

A unique work type (STPL) is used to track the costs associated with stockpiling material for use by NDOT maintenance forces. The correct breakout type to use for such breakouts is "Contractor". Use the activity code"9512" in the breakout detail window for this type of work. The GASB-34 selection should be "Existing". The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

Adjusting Covers & Utility Adjustments

The utility work type (Y060) is used to breakout the costs when the State is paying the contractor to adjust utility covers owned by the department. The GASB-34 selection should be "Existing". The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

The utility work type (Y060) is also used to breakout the costs when the State is paying the contractor to adjust utility covers owned by others. When a utility exists on the State's right-of-way with prior rights (also known as being "grandfathered in"), this obligates the State to pay for the adjustment. A separate breakout must be created for each such utility owner and the associated agreement number must be obtained from the Right-of-way/Utilities section and entered on the breakout detail window. The GASB-34 selection should be "Other". The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

The utility work type (Y060) is also used to breakout the costs to be reimbursed to the State for utility adjustments (other than adjust covers) owned by others. When a utility exists on the State's right-of-way and needs to be adjusted for roadway work, the utility owner is obligated to pay for the costs. A separate breakout must be created for each such utility owner and the associated agreement number must be obtained from the Right-of-Way/Utilities section and entered on the breakout detail window. The GASB-34 selection should be "Other". The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

When a utility's owner is obligated to pay for the cost of cover adjustments, they may enter into an agreement with the State to have the work performed by the State's contractor. A special work type (*ADJC*) is used to breakout these costs. A separate breakout must be created for each such utility owner and the associated agreement number must be obtained from the Right-of-Way/Utilities section and entered on the breakout detail window. Only standard utility cover adjustment item #'s are to be used in this breakout. The GASB-34 selection should be "Other". The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

The utility can have both prior and non-prior right adjustments and a breakout needs to be created for each. The prior right would be a work type of Y060.

When a utility's owner is obligated to pay for the cost of cover adjustments and they elect to perform the work with their own forces or their own contractor then these costs are not included anywhere in the estimate.

7.0.4 Work by Others

In-kind Services (734 0215)

When a contract includes work to be performed by a local agency's forces, and the work is to be counted toward that agencies share of the project costs, the In-Kind Services work unit (734 0215) is used to set aside the matching funds associated with the work. The amount for this work unit should be in the cooperative agreement between the local agency and the department. The GASB-34 selection should be "Other". The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

Utility Adjustment (734 0218)

When a utility is to be adjusted by the owner and paid for by the department the Utility Adjustment item # (734 0218) is to be used to set aside the funds associated with the work. The amount for this work unit should be in the agreement between the owner and the department. The GASB-34 selection should be "Other". The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

Railroad Flagging and Inspection

When a railroad is encountered in a project, the owner normally requires that their flaggers or inspectors be present during any work that may affect their facility's operations. Right of Way Utilities is responsible for the agreement with the railroad and paying the railroad for the flagging and inspection. The Designer/Estimator does not need to include this work in the engineers estimate.

Utility Flagging and Inspection (734 0221)

When certain utilities are encountered in a project, the owners may require that their flaggers or inspectors be present during any work that may affect their facility's operations. The department pays for such flaggers with the Utility Owner Flagging and Inspection item # (734 0221) is used to set aside the associated funds. The amount for this work unit should be in the agreement between the utility owner and the department. The GASB-34 selection should correspond with the "New", "Existing" or "Combined" selection in the appropriate breakout. The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

Railroad Construction (734 0227)

When a railroad is encountered in a project, the owner normally requires that their forces be used to perform any work on their facilities. The department pays for such work and the Railroad Construction item # (734 0227) is used to set aside the associated funds. The

amount for this work unit should be in the agreement between the railroad and the department. The GASB-34 selection should be "Other". The only ancillary costs associated with this work type are Construction Engineering and Contingencies.

7.0.5 Performance Reserves

Incentives (736 0030), (736 0033), (736 0043)

There are three item #'s used to pay incentives: HMA Incentive/Disincentive (736 0030), Ride Incentive/Disincentive (736 0033), and Incentive Payment (736 0043). Any contract that includes incentives must have one or more of these work units in the estimate in order to reserve the funding needed to pay the contractor for achieving any of the incentives. The construction division normally determines the type(s) of incentive that will be included in the contract. These work units can be in the main roadway breakout.

Disputes Review Board (736 0060)

On major contracts for which significant effort to process claims through the Disputes Review Board (736 0060) is anticipated, the funding needed to pay for the associated costs is reserved. The constructability section determines the need for the work unit and the amount of funding that will be included in the contract. This work unit can be put in the main roadway breakout.

8.0 Process Estimates

The system can make your job and managing the department's work program easier; some ways to do that are discussed here.

The engineer's estimate must eventually be processed into a preliminary estimate to facilitate advertisement and an agreement estimate to facilitate award of the contract and to prepare the estimate for creating the contractor payment side of the system.

8.0.1 Preliminary Estimate
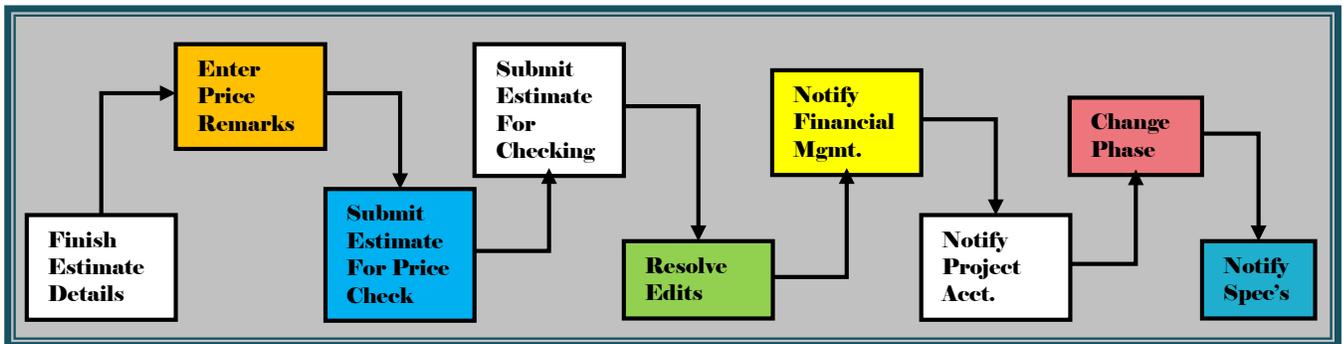
Overview

When the contract is ready for advertising, this interim step is the preliminary estimate. The general process is to complete the estimate details, have the prices checked, have the estimate checked, change the version to Preliminary Estimate; the estimate is then sent to EBS (Electronic Bidding System) by Specifications.

Final Preparation

In order for the preliminary estimate report to print with the necessary information, all of the fields on the project setup, estimate setup, and breakout details must be completed. This includes things like: [a] associated agreement numbers on the breakout detail for breakouts involving funds from local governments and third parties, [b] project locations on the project setup and [c] breakout descriptions and station limits on the breakout details.

The estimator must also be sure to add appropriate item comments using the Item Notes window. These remarks are often the only source price checkers have for getting the information needed to make intelligent decisions regarding the engineers estimated price for the item #'s on the contract. Any non-standard unit of work or any non-standard use of a standard unit of work requires a price check remark. Detailed procedures for entering price check remarks are given in the Price Remark section.

2 weeks prior to Doc. Date complete the following (Estimate should be at the Final Engineers version) –
- Submit the Engineer's Estimate to the Project Estimation Specialist to be reviewed.

1 week prior to Doc. Date complete the following -
- Notify Financial Management – April Pogue & Ron Haslem (Programming Unit), they will put a log entry of their approval (if you have not had a response within a day or two, follow up with a phone call)
- Notify Project Accounting – Katinka Rauch, Liz Sabo, Carrie Schenkhuizen & Norfa Lanuza will enter in the log a note of their approval (if you have not had a response within a day or two, follow up with a phone call)
- Need to have "price checked" indicator set by the Principle Road Design Engineer
- Need to have "estimate checked" indicator set by the Project Estimating Specialist

Advance estimate to the Preliminary Estimate version
- Notify Specifications writer on the project team (when you provide a pdf. of the plan set also include a pdf. of the Contract Work Item Summary report to your specs writer)

Submit Estimate for Checking

Before changing the estimate version, submit your Final Engineer's estimate report, copy of the program papers, and copies of any agreements that apply to your estimate, to the Project Estimation Specialist for checking. The estimate checklist will be completed by the Project Estimation Specialist, delivered to the estimator and the estimator should make the changes and file the checklist, along with the corrected Final Engineer's estimate report, in the project workbook. This checking service will save you a lot of time and effort in the long run. The estimator informs the Project Estimation Specialist that the corrections have been made and he/or she then sets the *Estimate Checked Indicator* on the Estimate Setup window.

Financial Management and Project Accounting Review

The designer, senior designer and the financial manager and project accountant assigned to the project coordinate to assure the estimate to be complete and correct.

After the price check and estimate check are complete, notify Financial Management and Project Accounting the estimate is ready to go to the Preliminary version and they will make a log entry of their review in the Estimate Setup window.

Submit Estimate for Price Check

When the price remarks are completed, the Senior Designer (Supervisor 3) should review the estimate and then submit a Contract Work Item Price report to the price checker prior to the Intermediate, QA & Preliminary estimate versions. The price check function is limited to engineers at the Manager 1 level and above.

The price checker establishes the engineer's unit prices and lump sum costs for the item #'s. Once the prices are checked, the Contract Work Item Price report is returned to the estimator who makes the changes. The estimator informs the price checker the corrections are done and he/or she then sets the ***Prices Checked Indicator*** on the Estimate Setup window.

Thereafter, if the estimator makes any changes to the estimate, the ***Prices Checked Indicator*** automatically resets to off and the price checker will need to be notified of the change(s). After making any appropriate adjustments, the price checker resets the ***Prices Checked Indicator*** to on. The system will not allow the project to be sent to EBS if the ***Prices Checked Indicator*** is not on.

System Edits for an Estimate Version Change

In order to change the estimate version from final engineers to preliminary, the estimate must pass a series of edits.

- Funding must be balanced in all breakout details with < $1.00 unfunded

- Phase, activity, and organization fields must be completed

- All item # unit prices must be >$0.00

- All required item comments for price checking are satisfied

- Estimate checked approval

- Price checked approval

Note: Financial Managements and Project Accountings log entry will need to be done prior to advancing to the Preliminary version.

Revisions

If the estimate has not be advanced to EBS, it can be unlocked by Specifications and the changes made without a New Bid Item version.

Once the Preliminary Estimate has been sent to EBS any item/quantity changes will require a "New Bid Item #" version and a Supplemental Notice will need to be issued if the contract has been advertised. Follow the following steps:

- Create a New Bid Item Version

- Make the changes needed in the estimate, including balancing the funding amounts

- Make a log entry on the Estimate Setup window of all the changes

- Save the estimate

- Have the "estimate checked" and "price checked" indicator set

- Notify Specifications

Confidentiality of Engineer's Estimate

During the project advertisement period, only a cost range will be published. The Engineer's Estimate must fall somewhere within the selected range.

The detailed Engineer's Estimate will be released at the end of the bid opening, if at least one conforming bid is received.

8.0.2 Agreement Estimate
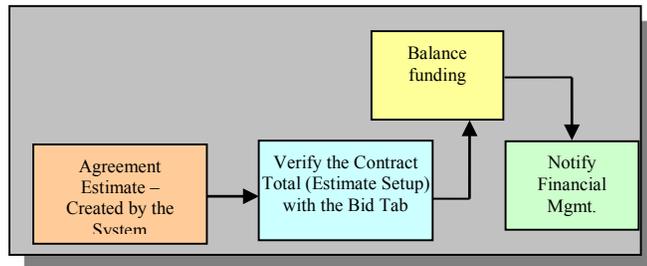
Overview

After awarding the contract, the winning contractor's prices are used to create the Agreement estimate. The Agreement estimate is created by EBS when the Contract is awarded and will need the funding balanced to equal the agreed prices.

Agreement Estimate version

You should receive a memo from Administrative Services that states, "Notice of Award…". Verify the Contract total, mobilization, and dust control on the bid tab matches the Estimate in iPD. Administrative Services will balance the funding when the Agreement Estimate is created. If there are multiple funding sources they may request assistance from the Designer.

Check Contract Amount

The estimate must match the contractor's bid exactly. The amount can be checked by comparing the **Contract Amount** field on *the Estimate Setup window* to the total bid amount from the Bid Tab.

9.0 Advance Concepts

Details for setting up and managing breakouts for different project characteristics.

9.0.1 Managing Breakouts

Breakout Types

The seven breakout types that are used in the system are: A+B Bidding, Contractor, Construction Engineering, Preliminary Engineering, Right-of-Way, Utility and Other. The primary function of breakout types is to group similar work units and define their order of appearance on the Engineer's Estimate report however they may also be used to associate breakouts with certain business rules.

A+B Bidding breakout type is a contract that includes two different types of bidding components in a single project. A "standard" contract has only the "A" component that consists of the "Total Amount of Proposal". The "B" part of the contract adds a component of "Established Working Day Number" to the project that is based on the bidder's intended working days of the contract. This procedure is used to determine the low bidder for the contract. For further definition and usage, see pull sheet 102.06.

The "Contractor" breakout type is used for work to be performed by the contractor's forces.

The "Construction Engineering" breakout type is used for construction engineering costs whether to be performed by state forces or by consultants.

The "Right-of-Way" breakout type is used for right-of-way acquisition costs, incidental right-of-way costs (such as for the preparation of parcel maps) and for the cost of adjusting utilities prior to the construction phase.

The "Utility" breakout type is only used for work to be performed by the utility owner's forces during the construction phase (concurrent with the contractor's operations) and the department is participating in the cost. This breakout type requires using the special work units and a work type of Y060.

The "Other" breakout type is used for work to be performed by forces other than the contractors during the construction phase (concurrent with the contractor's operations) and

the department is participating in the cost. Examples of "Other" breakout types are pavement marking by the state's forces, in-kind services performed by a county's forces or adjusting covers owned by an outside entity. This breakout type may require using the special work units.

Work Classification Codes

Contract costs are broken out by the character of work being performed in order for the department to ascertain and track the fiscal impacts associated with the various types of infrastructure and activities.

Following is a list of the work type codes to be used in your estimates:

ROADWAY AND SURFACE TYPE

The first digit is an alpha character and remaining digits are numeric.

D000	Soil surface
E000	Gravel or stone
F000	Bituminous surface treatment
I000	Roadway
J000	Portland cement concrete
K000	All others

BRIDGE TYPE

The first digit (code X) indicates bridge class; the second digit indicates nature of structure.

X0 - -	Highway over waterway
X1 - -	Highway over railroad
X2 - -	Highway over highway
X3 - -	Highway over waterway and railroad
X4 - -	Highway over waterway and highway
X5 - -	Highway over railroad and highway
X6 - -	Highway under railroad
X7 - -	Highway under highway
X8 - -	Highway under railroad and highway
X9 - -	Other combinations including over waterway, RR and highway; also 3 and 4-

level grade separations and miscellaneous

The third digit identifies the material of principal supporting members of the span.

X - 0 -	Timber
X - 1 -	Masonry
X - 2 -	Concrete, not pre-stressed
X - 3 -	Steel

X - 4 - Steel and concrete
X - 5 - Timber and steel
X - 6 - Timber and concrete
X - 7 - Composite steel and concrete
X - 8 - Concrete, pre-stressed
X - 9 - Aluminum

The fourth digit identifies type of span (if bridge comprises 2 or more span types)

X - - 0 Slab
X - - 1 Girder
X - - 2 Truss (except cantilever)
X - - 3 Rigid frame
X - - 4 Arch
X - - 5   Cantilever truss
X - - 6   Movable
X - - 7 Suspension
X - - 8 Box culvert (bridge length)
X 999 Highway tunnel

MISCELLANEOUS CODES

ADJC	Adjust Covers
CENG	Construction engineering
MAIN	Maintenance
PENG	Preliminary engineering
ROWA	Right of Way
SFPM	State Forces Pavement Marking
SFTY	Safety related work
STPL	Maintenance Stockpile
YHOV	High occupancy vehicle lanes
Y002	Traffic signs
Y003	Landscaping
Y007	Minor structure
Y008	Channelization of traffic
Y022	Comfort and convenience facilities; rest areas
Y026	Carpool facility (HOV)
Y030	Highway lighting
Y031	Traffic signals
Y032	Freeway traffic surveillance and control systems
Y033	Computerized arterial traffic signal systems
Y034	Motorist aid and emergency services system
Y035	Highway information systems

Y041	Special relocations (rivers, channels, etc.)
Y044	Incidental pedestrian facility
Y046	Incidental pedestrian and bicycle facility
Y047	Independent bicycle and pedestrian facility
Y050	Frontage road
Y051	Independent pedestrian facility
Y052	Independent bicycle facility
Y060	Utility adjustment
Y068	Rehab & operation of historic transportation facilities
Y077	Wetland mitigation due to highway runoff
Y080	Training (construction contracts)
Y102	Fencing
Y220	Noise abatement

10.0 System Reports

Estimate Reports

To get an Estimate Report choose the report you wish to view/print. Select the version and click the "Generate Report" button. Reports are available in a hard copy or a pdf.

- Engineers Estimate Report – shows the project information, breakouts, item #'s along with ancillary costs and funding appropriations (same as the old "CM18" report)

- Estimate Quantities by Breakout – shows items #'s, description, quantity by breakout, and amount (same as the old "CM11" report)

- Contract Work Item Report – shows item #'s, descriptions, unit, quantity, engineer's and agreed princes and price checking remarks (same as the old "CM13 & CM14" report)

- Bid Item Summary Report – shows item #'s, descriptions, units and quantities, no prices (same as the old "CM30" report)
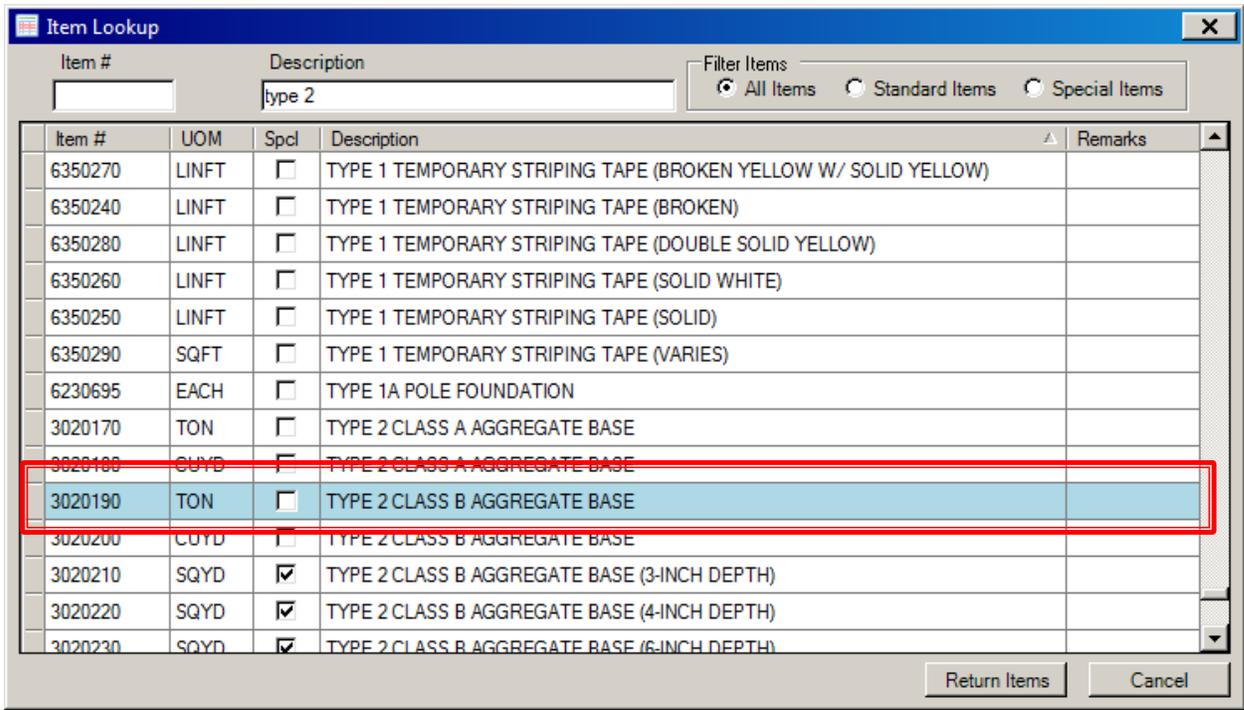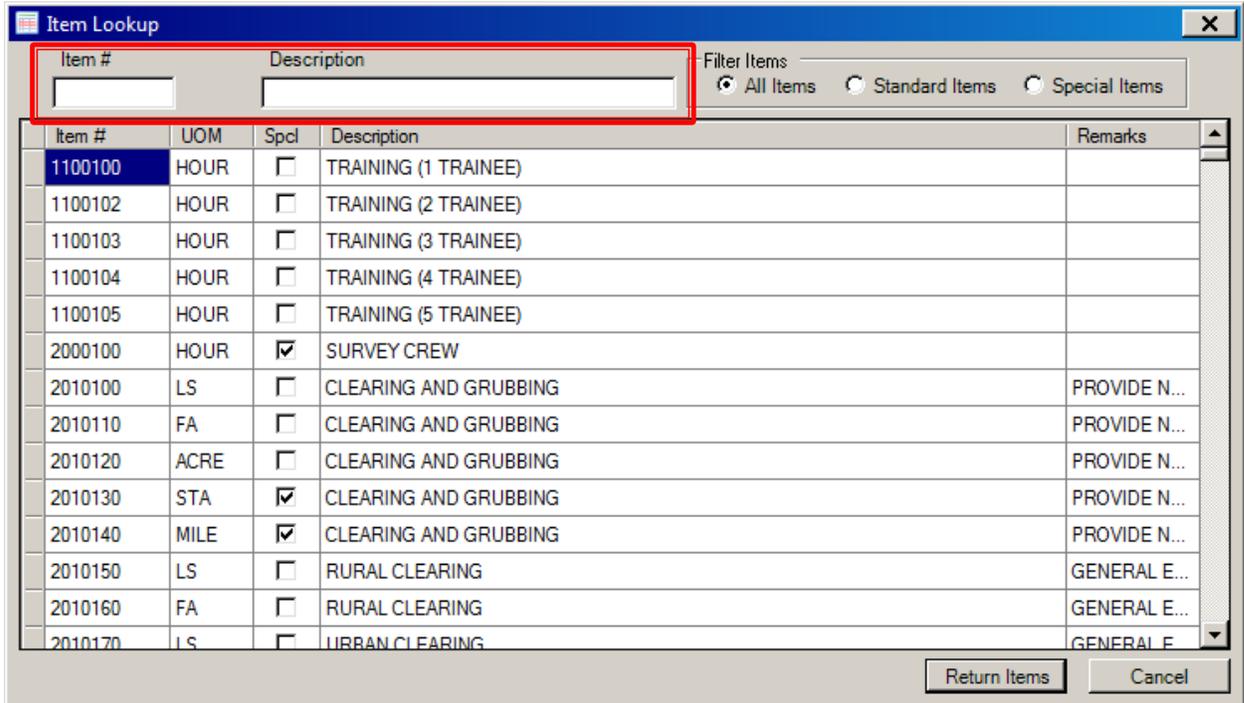
Item Price Lookup Reports

Choose Item Price Lookup and fill in the fields with criteria listed below. Reports are available in a hard copy or a pdf.

- Date Range
    - From – Dropdown or type over, default is the day the screen is opened
    - To – Dropdown or type over, default is the day the screen is opened
    - Note: Bid tabs are available from 2006 for the report (suggest entering at least a a year that is a couple of years previous to the current year)
- Bids
    - Awarded Only – Radio button and award only is the default and contains only awarded prices from the bid tab
    - All – Radio button and contains all bid prices from the bid tabs
- Location (Statewide+)
    - District – Dropdown and lists District 1, 2, 3, 1 & 2, 1 & 3, 2 & 3, and Statewide
    - County – Dropdown and lists all counties & a choice of multiple
- Demography
    - Urban – Checkbox, choose the one relative to the project
    - Rural - Checkbox, choose the one relative to the project
- Quantity Range
    - Minimum – Free form numeric text (suggest using default)
    - Maximum - Free form numeric text (suggest using default)
- List Options
    - Item Summary – Radio button, lists the bid item(s), price & quantity (search criteria is listed at the bottom of the report)
    - Contracts – Radio button, lists the bid items(s), price, quantity, & contract information (search criteria is listed at the bottom of the report)
    - Contractors – Radio button, lists the bid item(s), price, quantity, contract information, & all contractor bid information (search criteria is listed at the bottom of the report)
- Select Item -   When all criteria is completed for the first six (6) fields listed above, click "Search" and the "Item Lookup" screen will display. The system can search

items by the Item # or Description. Click on the item(s) to be displayed in the Item Lookup report and click on "Return Items". Then click "OK" to display the report.

Note: The row of the item(s) that are selected will be blue.

Examples of the available reports are shown below.

Item Price Lookup - Item Summary							
					Statewide	District	
Item Number	Unit	Item Description		Price	Total Quantity	Price	Total Quantity
5020920	CUYD	CLASS A CONCRETE, MODIFIED (MAJOR)	Weighted Avg:	$417.68	365,469.600	$384.99	252,254.000
			High $:	$1,250.00		$1,250.00	
			Low $:	$200.00		$200.00	
			High Qty:		20,780.000		20,780.000
			Low Qty:		132.000		132.000
4070180	TON	EMULSIFIED ASPHALT, TYPE SS-1 (DILUTED)	Weighted Avg:	$1,033.33	3.000	$0.00	0.000
			High $:	$1,500.00		$0.00	
			Low $:	$600.00		$0.00	
			High Qty:		1.000		0.000
			Low Qty:		1.000		0.000

Weighted Average Price Calculation Criteria
Location: STATEWIDE District 1
Date Range: 10/14/2006-10/14/2013

Minimum Qty: 1.00
Maximum Qty: 9,999,999.00

All bids: YES

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10/14/2013

Print

Item Price Lookup - Contracts

Item Number	Unit	Item Description		Price	Statewide Total Quantity	Price	District Total Quantity
5020920	CUYD	CLASS A CONCRETE, MODIFIED (MAJOR)	Weighted Avg:	$417.68	365,470	$384.99	252,254
			High $:	$1,250.00		$1,250.00	
			Low $:	$200.00		$200.00	
			High Qty:		20,780		20,780
			Low Qty:		132		132

Contract Number	Location	Funding Type	Item Quantity
Contract Description	County	Bid Open Date	Bid Unit Price
3324			17,620.000
ON SR 160 BLUE DIAMOND RD FROM DECATUR BLVD TO RAINBOW BLVD	CLARK	7/19/2007	$424.06
3339			10,474.000
ON SR 573 CRAIG ROAD IN NORTH LAS VEGAS AT THE UPRR CROSSING AND SR 573 CRAIG RO	CLARK	9/6/2007	$573.67
3445			132.000
US 95/*515 OVER FLAMINGO ROAD INTERCHANGE	CLARK	2/24/2011	$975.00
3530-READV		FEDERAL	20,780.000
Construct a New Interchange	CLARK	11/15/2012	$295.48

Print

Item Price Lookup - Contractors

Item Price Lookup - Contractors

Item Number	Unit	Item Description		Statewide Price	Statewide Total Quantity	District Price	District Total Quantity
5020920	CUYD	CLASS A CONCRETE, MODIFIED (MAJOR)	Weighted Avg:	$417.68	365,470	$384.99	252,254.000
			High $:	$1,250.00		$1,250.00	
			Low $:	$200.00		$200.00	
			High Qty:		20,780		20,780.000
			Low Qty:		132		132.000

Contract Number / Contract Description	Location / County	Funding Type / Bid Open Date	Item Quantity / Bid Unit Price
3324			17,620.000
ON SR 160 BLUE DIAMOND RD FROM DECATUR BLVD TO RAINBOW BLVD	CLARK	7/19/2007	$424.06

Contractor Name	Bid Unit Price
FREHNER CONSTRUCTION CO., INC.	$345.00
Road and Highway Builders LLC	$400.00
Meadow Valley Contractors, Inc.	$400.00
Las Vegas Paving Corporation	$460.00
Capriati Construction Corp., Inc.	$515.31

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11.0 System Support

A discussion on system help and reporting problems

Help File
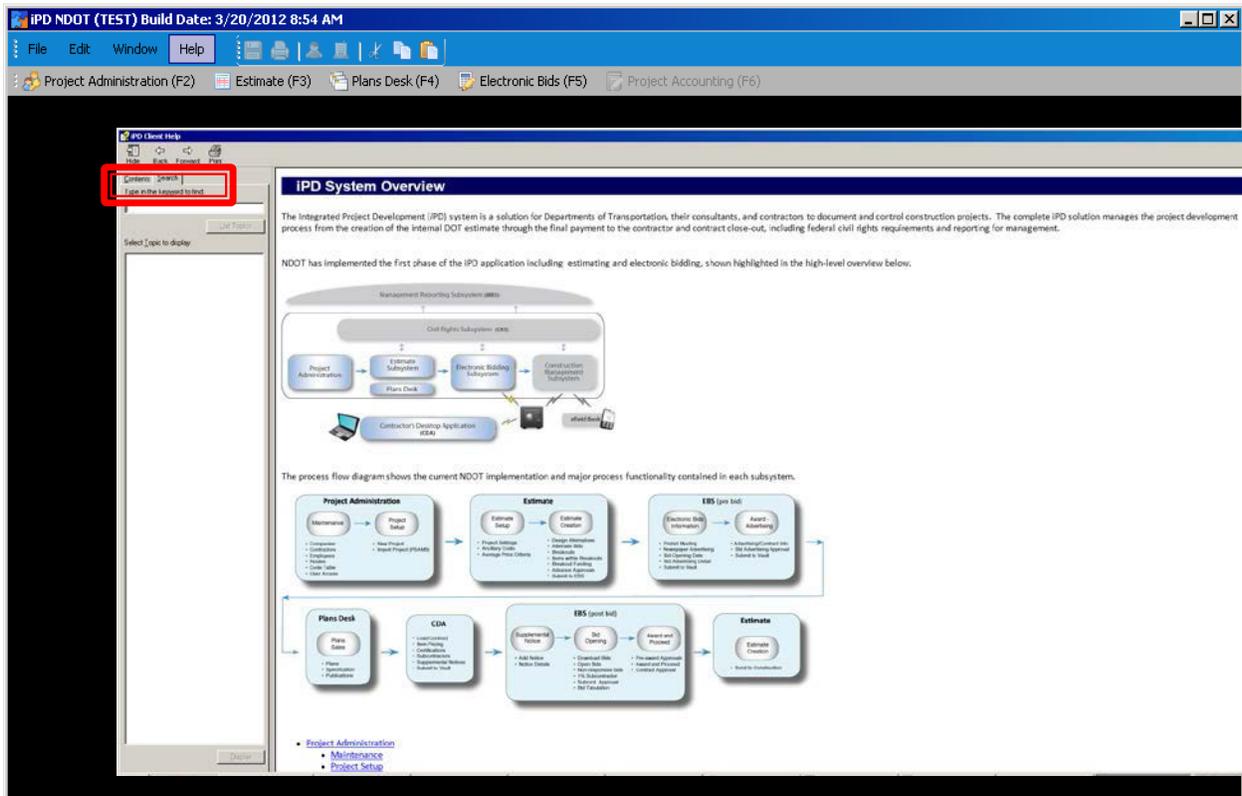
The Help Menu can be accessed in one of the following ways –
- Pressing F1
- Selecting "Help" from the menu bar

You can search by the "Contents" tab or "Search" tab. The "Contents" list the subsystems in iPD and you can expand the subsystems to view the related topics. The "Search" tab will filter topics based on a key word or phrase.

Problem Reporting

The Project Estimation Specialist is responsible for improving and maintaining the project cost estimation module. All problems and suggestions regarding the project estimation system should be communicated to the Project Estimation Specialist. The specialist will determine the proper course of action for handling issues associated with the project estimation system.

Coordination among several Divisions and management is often required prior to implementing new procedures or making changes to the system.

The Project Estimation Specialist is authorized to submit requests for modifying the system. This is usually done only after careful consideration has been given.