Oregon Department of Transportation

Estimating Manual

Statewide Project Delivery Branch

Project Controls Office

June 2024

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Purpose of Manual

The purpose of the Oregon Department of Transportation's Estimating Manual is to provide guidance and a resource to understand the cost estimating process for design-bid-build construction projects administered by ODOT. Cost estimates are developed as early as the scoping phase of a project and are continually revised and updated until the project bids.

The cost estimate prepared for PS&E submittal is used to generate the official bid schedule for a project and is included in package prepared by the Project Control's Office for FHWA authorization.

The cost estimate is used to determine the class(es) of work for a project, the advertisement period, the contract provisions for price adjustments for changes in commodity prices.

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Definitions & Acronyms

AASHTO	American Association of State Highway Transportation Officials, provides technical services and transportation-related policies to support states in their efforts to efficiently and safely move people and goods.
AWP Preconstruction (PreCon)	The AASHTOWare project module for proposals, estimates, lettings, and awards. PreCon is used by various roles in the Tech Centers, Project Controls Office and ODOT's Procurement Office – Construction Section.
Cost	Cost is an expense paid out. It implies an expense was actually incurred.
EE	Engineer's Estimate is the official estimate based on the bid schedule at the time of bid. The EE is prepared by PCO and used for bid analysis and construction authorization. The EE includes addenda between PS&E submittal and bid opening.
FHWA	Federal Highway Administration is part of the U.S. Department of Transportation. FHWA is in charge of ensuring America's roads and highways continue to be safe and technologically up to date. FHWA helps states by providing financial and technical support for constructing, improving, and preserving America's highway system.
OPO – CCU	ODOT Procurement Office – Construction 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.
PCO	Project Controls Office is a unit within ODOT's Statewide Project Delivery Branch. It includes Pre-Letting, Specifications, Estimating, and Quality Assurance for Design. PCO provides the professional conduit to assist the project team in successfully delivering a project to bid.

Price	Generally, an estimate, quote, or a bid. It implies an agreed-upon rate of exchange between two parties for services.
PS&E	Plans, specifications, and estimate is a scheduled milestone event wherein all elements of a project necessary for ODOT to advertise for bid have been delivered and accepted as completed by ODOT's Project Controls Office.
PS&E Provider	The PS&E provider is 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.

Section 1 – Cost Estimating Requirements and Responsibilities

Estimating Requirements

ODOT uses the AASHTOWare Project™ (AWP) data management system (link). ODOT requires the Estimation module of AWP to prepare construction cost estimates during project development as required per Project Development Bulletin PDB-03.

The Role of Individuals Preparing Estimates for Projects

Individuals who prepare cost estimates are trained and certified to use ODOT's estimating system. These individuals collaborate with the project's engineering disciplines to compile quantity and estimated cost information to create construction estimates at each milestone containing a comprehensive list of pay items and anticipated items, along with an estimated budget for construction engineering. Typically, these individuals are also assigned to compile the special provisions that relate directly to the pay items being used for the project.

These individuals prepare the "region's estimate", not to be confused with the official Engineer's Estimate prepared by the Project Controls Office.

The Role of the Project Controls Office Estimators

Project Controls Office (PCO) estimators perform the following functions:

- Process the region's estimate when a project's PS&E package is submitted to PCO.
    - Resolve any errors or inconsistencies with the region's estimate.
    - Build the project's items (bid/pay items)
    - Assign the proposal/contract number for the project.
    - Uses the region's estimate to generate a bid schedule that PCO uses during its quality assurance review and includes in a package to FHWA for authorization.
    - Ensure the appropriate class of work has been selected based on the estimate.
- Prepare the official Engineer's Estimate (EE) immediately prior to bid (see PD-07 PS&E Submittal to Bid Opening).
    - Review the official bid documents along with the region's estimate.
    - Consider project scope, recent bid data, commodity pricing, workforce requirements (DBE, TERO, CWA, PLA), expected local competition, schedule, and complexity, as well as location of the project and all risk that is being passed onto the contractor.
- Analyze bid prices and provide a bid analysis and recommendation to the Office of Procurement according to PD-08 Bid Opening to Notice to Proceed.
- Support ODOT's cost estimating program including systems, policies, bulletins, manuals, training, presentations, wage rates, and commodity price tracking (steel, fuel, and asphalt).
- Answer questions related preparing estimates and understanding market trends.
- Review estimates when requested by regions for quality assurance at project development milestones, especially when there are concerns about funding or project scope (especially at Design Acceptance Phase (DAP))
- Participate in programs that improve design, promote cost effectiveness, and manage risk.

- Constructability Reviews- provide cost models for multiple construction scenarios and project alternative analysis.
- Value Engineering (VE)-; Participate in VE Teams to act as a subject matter expert on costing various alternatives presented by the VE Teams
- Cost Risk Assessments (CRA)- Act as a subject matter expert to assist in creating a probabilistic cost estimate by providing feedback and analysis of risk impacts and possible mitigations.

Section 2 – Cost Estimating Methods

Cost estimates should reflect the amount that ODOT considers fair and, reasonable, and is willing to pay for performance of the proposed work. Under-estimating may cause project delay because additional funding must be arranged to meet additional costs. Over-estimating causes inefficient use of funds, which could be used for other projects.

To accurately develop a construction cost estimate for a project, an estimator must be capable of mentally constructing the project, and then accounting for all the activities necessary to complete it, including labor, permanent materials, temporary materials, equipment, subcontractors, testing and inspection. 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 budgets 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) and any inherent risk that is being passed onto the perspective bidders.

There are three main methods to estimate: Bid based, cost-based, and a combination of the two.

Bid-Based Estimating

Bid-based estimating uses historical data, unit prices and quantities from recently awarded contracts to form an estimate. This approach is a cost-effective method to develop an estimate. However, solely relying on historical data may not be appropriate when the data is based on a non-competitive bidding environment or the phasing and staging of the project doesn't reflect the existing data and the unique composition of the work to be completed. When bid-based estimating, 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 to use in bidding/programming if competitive bid processes are used. Non-competitive and unbalanced bidding practices are the least recognizable using this method.

Cost-Based Estimating

The cost-based estimating takes into consideration factors related to performance of the work (i.e., the current cost of labor, equipment, materials, sequence of operations, production rates, indirect project overhead, and a reasonable value of corporate 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 aiding of the decision to award or reject the project.

This method is more time-consuming and may not be practical for all projects. These estimates are typically used in an independent cost estimating role or design concept for programming large complex

projects to better define the level of confidence in a bid-based estimate. The information below outlines the minimum requirements and standards for producing cost-based estimates. Independent cost estimating is the use of a third-party estimator to estimate a project to validate or inform the base cost estimate. These estimates are to be constructed without bias from any other party and shall represent the cost of the work.

If a cost-based estimate is a required submittal, it must be compatible with Heavy Bid (HCSS)

If using HCSS, the following documents must be submitted along with your estimate:

- EST HCSS file with backup (read/write access)
- Cost reports
    - Labor use- totals only
    - Equipment by equipment – totals only
    - Direct cost report
    - Tax and fringe breakdown
    - Fuel consumption report
- Summary reports
    - Estimate recap
    - Chief estimator's analysis
    - Bide summary cost and price
    - Basic bid proposal
    - Risk analysis report
- Estimate narrative
    - Narrative outlining the basis of the cost estimate and all relative assumptions.

The following process shall be used when performing cost-based estimates:

1. Cost based estimate kickoff meeting.
    - TPM, RE, RECP, estimators, and consultants shall have a meeting to lay out the Project Risk Register and come to a documented project agreement on the following items:
        - Labor rates.
        - Equipment rates.
        - Fuel rates.
        - Labor inflation.
        - Anticipated project duration.
        - Site constraints.
        - Environmental permitting assumptions
        - Estimate bid items.
        - Verify and agree to bid item quantities.
        - TCP requirements and work restrictions.
        - Permanent material pricing.
        - Anticipated items list (not an exclusive list.)
            - Fuel escalation.
            - Steel escalation.
            - Asphalt escalation.
            - Agency furnished materials.
            - Asphalt smoothness bonus.
            - Public outreach.
            - Utility reimbursements.
        - Right of Way assumptions.
        - Project risk- quantitative or qualitative.
        - Anticipated general contractor fee.
        - Preliminary engineering budget.
        - Construction inspection budget.
        - Contingency + inflation.

    These items need to be vetted by the project delivery manager, area manager, and design team lead and in conjunction with a cost estimator at the Project Controls Office. They should also be documented prior to cost estimate creation to ensure all project teams and estimators are estimating the same project assumptions. This allows the estimator to focus on means and methods while maintaining consistency with the project documents. These items are just the base assumptions for the project. If they are changed from the base assumptions, estimators will need to document the justification. The items listed above shall be documented in basis of cost estimate narrative.

2. The following progress meetings shall occur during development and finalization and reconciliation of the estimates; during reconciliation the project ream shall perform quality assurance on the cost estimate and reconciling differences between the base cost estimate and the independent cost estimate.
    - 30% complete estimate.
        - Discuss relative constraints.
        - Ask follow-up questions.
        - Receive update on estimate.
        - Review risk log.
        - Review assumptions log.
    - 60% complete estimate.
        - Discuss relative constraints and critical issues.
        - Estimator to ask clarifying questions.
        - Receive update and estimate.
        - Review risk log.
        - Review assumptions log.
    - 90% complete estimate
        - Review estimate narrative.
        - Review estimate by line item
        - Review assumptions and contingencies.
        - Review risk log.
        - Review project overhead and fees.
    - 100% complete estimate.
        - Reconcile estimates between estimators.
            - Review means and methods.
            - Review assumptions.
            - Discuss differences.
            - Ask for further information.
            - Adopt the estimate.
3. Structure: The following is a basic structure for creating cost-based estimates:
    - All bid items shall use ODOT's current standard bid item list.
        - Items can have unique bid items but must carry the ODOT bid item number as the client number.
        - All lump sum items shall be constructed using sub bid items called child items. Each child item shall have defined quantities and costs relative to that child item. These child items will roll up to the ODOT bid item, also called the parent item.
        - Unit based items can have sub bid items as well. Use the same structure for the unit times as used in the lump sum items.
    - Resource Coding: Resources shall be coded in a way that allows reports to be executed to summarize in detail each resource in the estimate. Resources shall be defined as classes of labor, types of equipment, types of permanent materials, types of construction materials, rented equipment, operated rental equipment, subcontractors, and operational

expenses and overhead. Coding should have the following structure and all resources shall start with the numeric list below and additional letters or numbers to specifically identify the resources in that category:

- Labor 1xxxx.
- Permanent materials 2xxxx.
- Construction materials 3xxx.
- Subcontractors 4xxx.
- Operated equipment rental 5xxx.
- Un-operated equipment rental 6xxx.
- Small tools and miscellaneous supplies 7xxx.
- General conditions 9xxxx.
  - Project overhead to include the following:
    - Jobsite trailers.
    - Jobsite utilities.
    - Toilets.
    - Office equipment.
    - Project management vehicles.
    - Taxes.
    - Bond.
    - Insurances.
    - Permits.
    - Engineering.
    - Per diem.

- Items that need to be considered in addition to the construction cost are the following:
  - Construction engineering/inspection.
  - Right of Way cost.
  - Utility reimbursements.
  - Anticipated items: This list may vary by project.
    - Asphalt escalation.
    - Steel escalation.
    - Fuel escalation.
    - Smoothness bonus.
    - Agency furnished materials.
    - Public outreach.
  - Project contingencies.
    - Design progression allowances.
    - Inflation.
    - Legislative changes.
    - Risk based contingencies.

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 (i.e. 75 percent) of the total cost. The major contract items may include Portland Cement, concrete pavement, structural concrete, structural steel, asphalt concrete pavement, embankment, or other major items or 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.

Section 3 - Preparing Cost Estimates in Estimation

Estimation Training

Estimation is ODOT's estimating program. Anyone who prepares construction cost estimates for ODOT projects is required to get certified in Estimation. PCO will grant access to Estimation after users attend a training class and pass an exam. Certification consists of a two-step process available for ODOT and consultant users.

1. Complete the self-guided training curriculum in Workday. The curriculum consists of 6 modules that that 15-20 minutes each to complete. Course: ODOT – ENG – AWProject Estimation
2. Attend the certification class taught by the PCO estimators and pass the exam. Course: ODOT – ENG – AWProject Estimation – Estimation Certification – Virtual

Additional training and guidance can be found on the AASHTOWare Estimation page.

Access to Estimation

To create an estimate using Estimation, the estimate must be associated with a project in ODOT's AWP system. Access AWP at https://oregondot-pr-prod.infotechinc.com/. If the project is not in AWP, it may not exist yet in the system or you may not have access. Prime consultants only have access to projects they are assigned to and subconsultants will only have access to estimates created by the prime consultant and assigned to the subconsultant. Contact AWPAdmin@odot.oregon.gov for assistance.

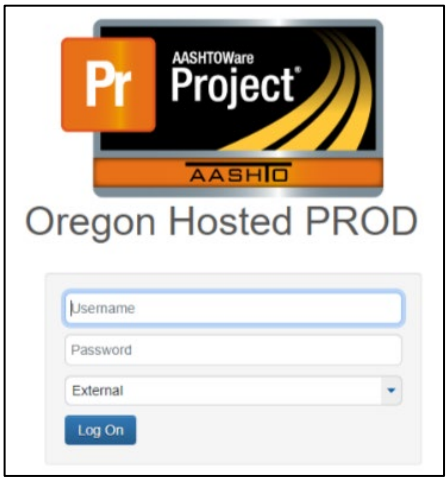


Figure 1 - AWP Access Login for Non-ODOT

After logging in, access the project:

1. Select Projects on the Home page under Preconstruction.
2. Type in a key # or Description in the Project Overview page search criteria.
3. Select the project.

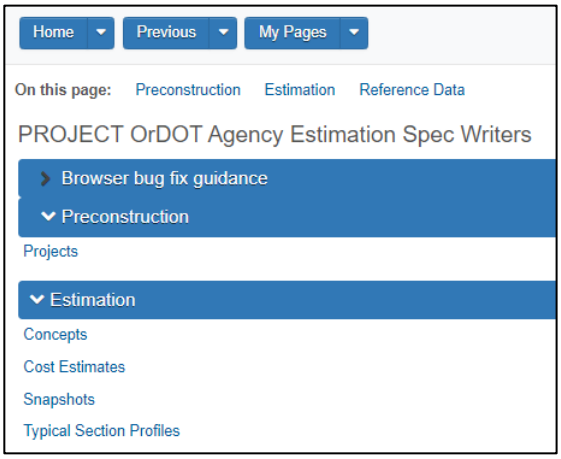


Figure 2 - Projects Access

Once the project is selected, the General tab on the Project Summary page will show project information preloaded into the system. No data entry is necessary on this page. If there is data that appears incorrect, first contact the region STIP Coordinator to resolve. If there appears to be a data transfer issue, contact AWPAdmin@odot.oregon.gov.

Creating a Cost Estimate

Create Initial Estimate

1. Click the Cost Estimate at the top of the web page.

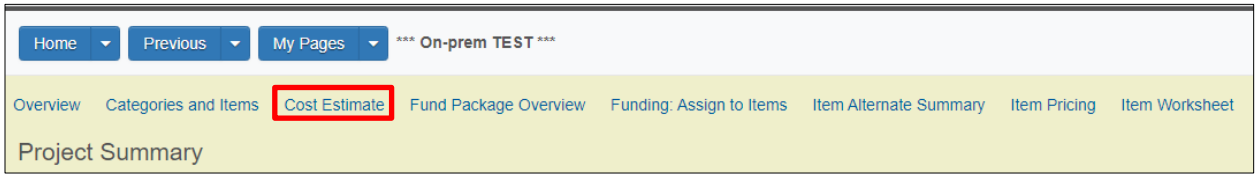


Figure 3: AWP top navigation tabs.

2. Select the Cost Estimates tab.

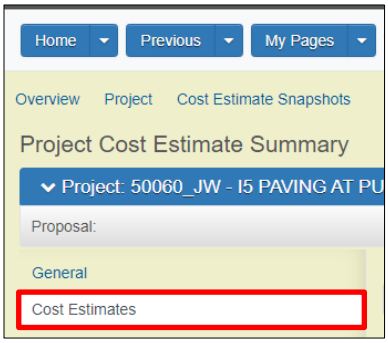


Figure 4: Cost Estimate tab location.

3. Click the blue Action arrow.

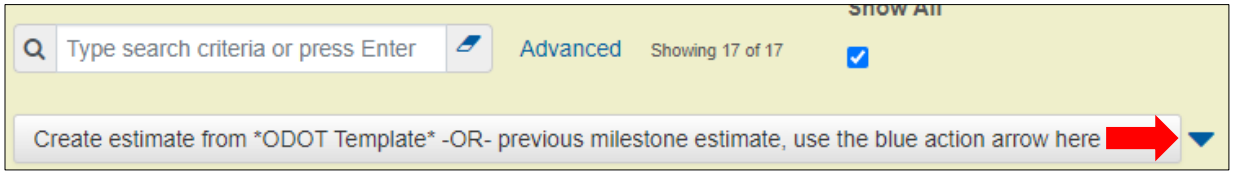


Figure 5: Row action location.

4. Click Copy Cost Estimate.

5. Select the _ODOT_Template.
    a. If other projects are showing in the window, make sure Show Profiles Only is checked to only show the template.
    b. This template contains standard bid items and anticipated items that are typically included on projects and has preloaded contingencies and construction engineering price references.

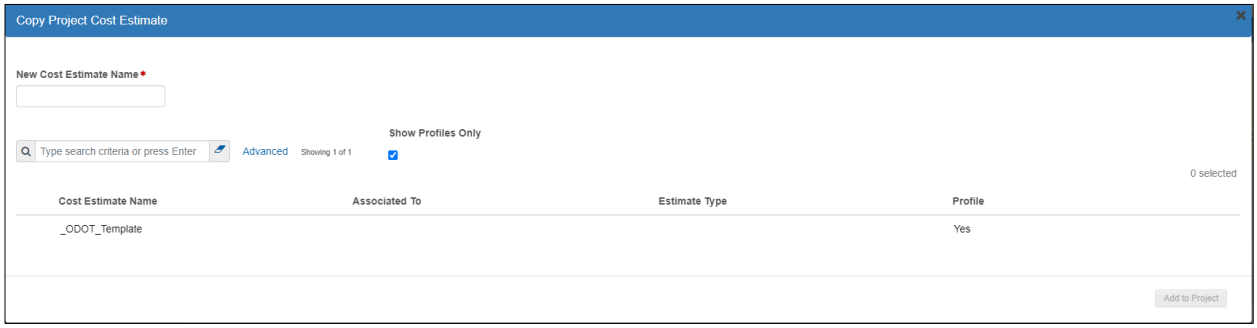


Figure 6: Copy Project Cost Estimate window.

6. Name the estimate in the blank field under New Cost Estimate Name
    a. K#####_Phase_EST_##
        i. K##### is the project key number.
        ii. Phase is the estimate phase, i.e. dDAP, DAP, ADV, FNL or PS&E.
        iii. ## is the version.
7. Click Add to Project

Once the estimate is added to the project, click on the estimate name and enter general information about the estimate in the General tab.

1. Estimate Description
    a. The estimate description should illustrate the phase of your estimate, IE if you are producing a DAP estimate the estimate description should be DAP ESTIMATE. Estimate descriptions should be the PHASE_ESTIMATE.
2. Estimate Phase
    a. The Delivery Phase of the estimate. Estimate phase selected corelates to contingency assignments.
3. Estimate Type
    a. Merge Estimate is an estimate that combines all estimate disciplines. Merged estimates are all we are promoting the use of currently.
4. Estimated By
    a. The certified estimator that is entering the estimate.
5. Estimate QA By
    a. Identify the technical lead that is reviewing the completeness of the estimate.

6. Bid History Profile
    a. Bid history profile selection is the default selection of your bid regression profile that will be used on the estimate. This can be changed on an item-by-item basis.

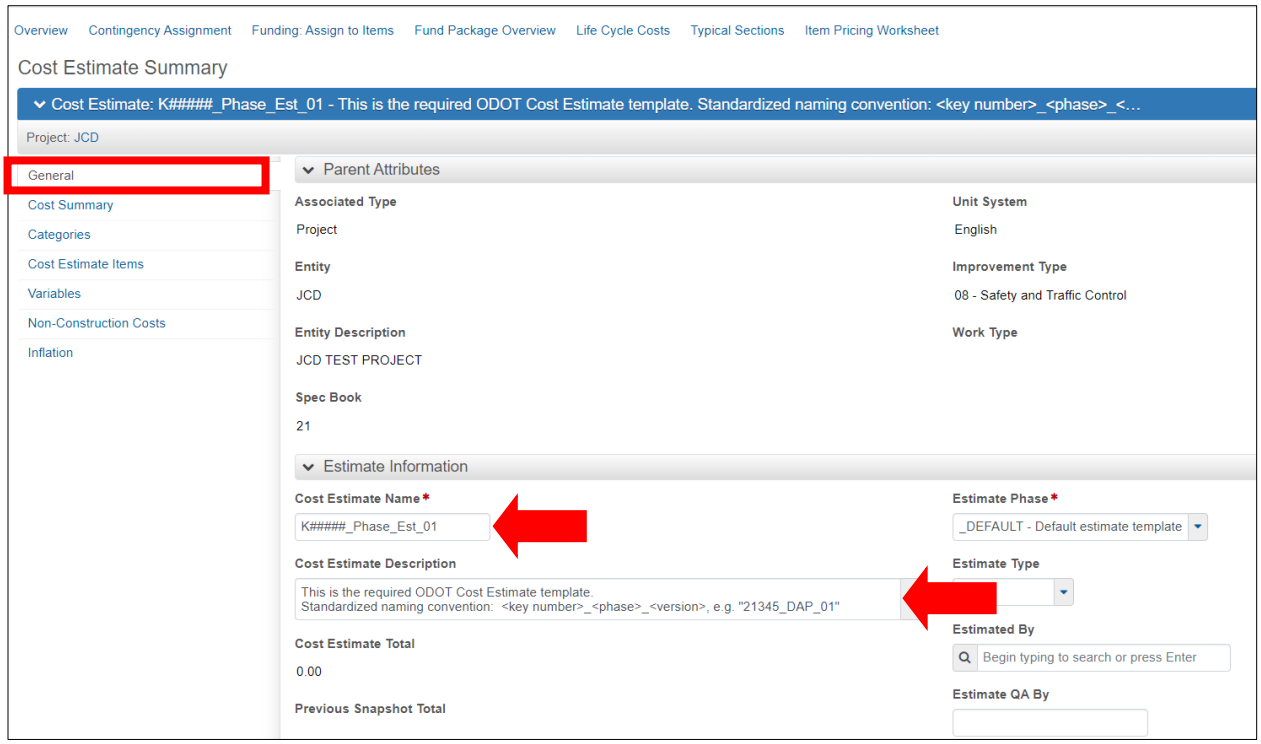


Figure 7 - Cost Estimate Summary General Information

Create Additional Estimates

After the initial estimate is created, a new estimate is created for each project development milestone. A copy of the existing phase estimate is necessary to develop a repository of the existing estimates and allow other reporting features to segmentally review the cost and scope changes over the life of the project. This is done by copying the previous estimate or creating a new estimate from the _ODOT_Template. Occasionally the _ODOT_Template is updated and may be the preferred template moving forward. Estimation users will be notified if a new template should be used.

Follow the directions below to copy an existing estimate in Estimation:

1. Click Projects.
2. Search for key number.
3. Select project.
4. Select Cost Estimate.
5. Select the Cost Estimates tab.
6. Click the blue Action arrow.
7. Click Copy Cost Estimate.

8. Uncheck Show Profiles Only
    a. This will show all cost estimates you have access to.

Figure 8: Show Profiles Only checkbox location.

9. Search and select the previous cost estimate you want to copy.
10. Enter New Cost Estimate Name
    a. K#####_Phase_EST_01
11. Click Add to Project
12. Upon completion of adding the new phased estimate. Updated the estimate description name.
13. Update the estimate phase drop down to the applicable phase and hit "Save".

Add Project Items

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 PCO.

Biddable Items

The Oregon Standard Specifications for Construction and Boiler Plate Special Provisions establish the bid items for which work will be paid. Except for the items identified in the specification 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 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.

Each standard bid item is assigned a set of numbers and letters that help to describe the item. Below is an example item number:

- Example Item Number: 0225-2C00400E
  - The first four numbers (0225) in the item number are the specification number that item falls under.
  - The last letter in the item number "E" shows the unit of measure that the items is. The "E" stands for "each."

To view what all the last letters in the item number mean, see Appendix B. To view a total list of active bid items please see the bid item list, posted here.

Follow the directions below to add bid items in Estimation.

1. Navigate to the Item Pricing Worksheet
2. Click Select Items… located at the bottom of the Item Pricing Worksheet
   a. Search for standard bid item.
   b. Select bid item. Multiple bid items can be selected at one time.
   c. Click Add to Cost Estimate Item.

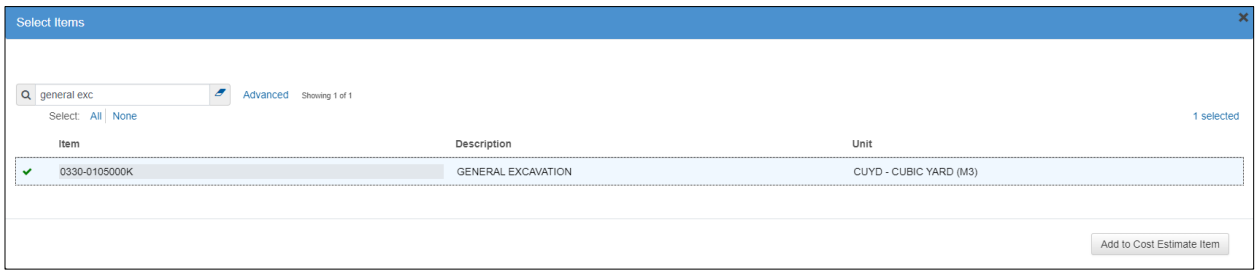


Figure 9: Select Items window.

3. Add quantity in Quantity column.
4. If needed, Enter supplemental description in Supp Descr column.
   a. The supplemental description must include the entire name of the bid item and all of it must be capitalized. When a supplemental description is used, only the information in the supplemental description column will appear on the bid schedule. Supplemental descriptions are used to fill in the blanks of standard pay item descriptions or to create a unique pay item description using a closely related standard pay item. Supplemental descriptions are required when a miscellaneous pay item is created.

Description	Supp Descr
PG 64-22 ASPHALT IN _____ ACP	PG 64-22 ASPHALT IN 1/2 INCH ACP
PG 70-28ER ASPHALT IN _____ ACP	PG 70-28ER ASPHALT IN 1/2 INCH ACP

Figure 10: Supplemental description example.

5. Click Save

Incidental Work

Incidental work is relatively minor work necessary to complete primary bid item work for which there will be no separate or additional payment. The following subsections contain provisions in which pay items may not be listed on a bid schedule even though there is work associated with those pay items, because the amount of work may be relatively so minor that the payment of that work would be paid for using other pay items for which the minor work is needed. (for example, the watering pay item is usually not used to pay for watering and instead it is paid for as part of the earthwork pay item that requires the water).

00210.90 – Mobilization
00221.90 – Common Provisions for Work Zone Traffic Control (Work Zone traffic control only)
00310.90 – Removal of Structures and Obstruction
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
00510.90 – Structure Excavation and Backfill (shoring, cribbing and cofferdams only)
00585.90 – Expansion Joints (control joints only
00610.90 – Reconditioning Existing Roadway
00706.90 – Emulsified Asphalt Slurry Seal Surfacing

Lump Sum Items

Standard lump sum items are identified in the Oregon Standard Specifications and Boiler Plate Special Provisions and show a quantity of "ALL" (denoting a quantity of 1.00) on the bid schedule. In Estimation, ODOT uses "hybrid" lump sum approach for several items, where the estimate will contain the estimated quantities of materials listed in the special provisions or shown on the plans, but the bid schedule will show item bidding as lump sum. Examples of hybrid lump sum items are structural concrete, structural steel, bridge rail, sign supports, and clearing and grubbing. All lump sum items are identified by an "A" as the last character in the item number.

a. Using 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.

Before creating a non-standard lump sum item, consider that lump sum items typically transfer risk to the contractor. Contractors may raise prices to take on this risk. Contractors cannot necessarily rely on overruns to cover work they did not foresee. Using 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.

Lump sum items should only be used when the following conditions apply:

1. The lump sum item is a standard item, and no appropriate alternative non-lump sum standard item is available.
2. The work is not easily defined. The final product is known but the construction techniques or other components are difficult to determine.
3. The work is complex with many components (the designer is encouraged to break down lump sum items to their constituent items if possible.)

Lum Sum Item Breakdowns

All lump sum items cost should be derived from a lump sum schedule of breakdowns. This breakdown shall clearly articulate the cost associated with the task applicable to the Lump Sum pay item. These breakdowns shall be stored in ProjectWise as a price justification to the Lump Sum price provided.

Percentages for Lump Sum Items

The following percentages were developed to show the typical percentage range for specific items. You should decide on these percentages before the project goes into the estimating phase and document it 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	5% - High dollar paving projects, preservation (non-urban.) 5% - Normal. 8% - Several areas of work simultaneously where TP&DT (Temporary Protection & Direction of Traffic) is needed. 10% - 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 & Grubbing	Identify number of acres and cost out as per sheet #1 in the Clearing & Grubbing Worksheet.

Non-standard Items

Non-standard items are biddable items not listed in the ODOT Standard Bid Item List.

- If a non-standard pay item is similar in scope of work to a standard item, the standard pay item is selected and then modified using the supplemental description.
- If there is no closely related standard bid item, one of the Miscellaneous items are used (item codes starting 1999-9Z90000) with the name of the item as it appears in the special provisions into the supplemental description field. All unit price information is manually entered for these items. These items are one-of-a-kind, non-recurring bid items. However, ODOT Specifications may create standard items for frequently used non-standard items and Miscellaneous items need to be doubled checked before submitting PS&E.

If a Miscellaneous item is being added to a cost estimate, at a minimum the class of work, specification section and item production rate is required to be entered in Estimation for the Fuel, Steel, COW worksheet to calculate correctly. **Miscellaneous items must be entered in the *Cost Estimate Items* tab.**

1. In the Cost Estimate Items, enter the bid item information and the following information into the 9Z9 REQUIRED fields:

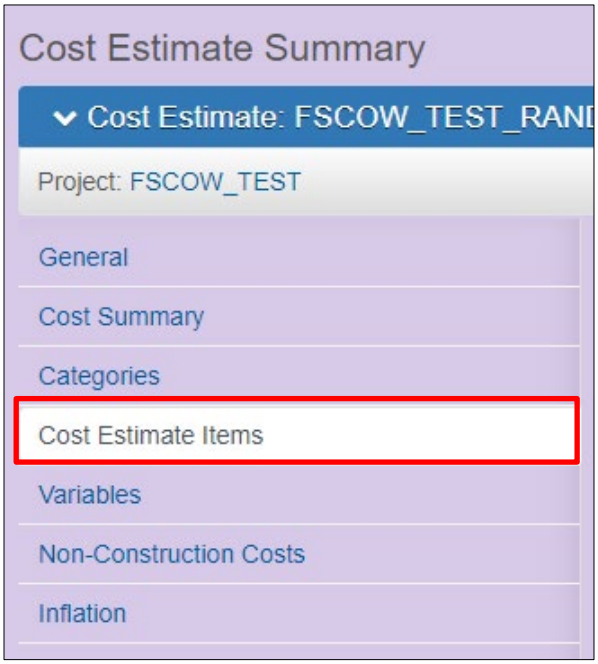


Figure 11: Cost Estimate Items Location

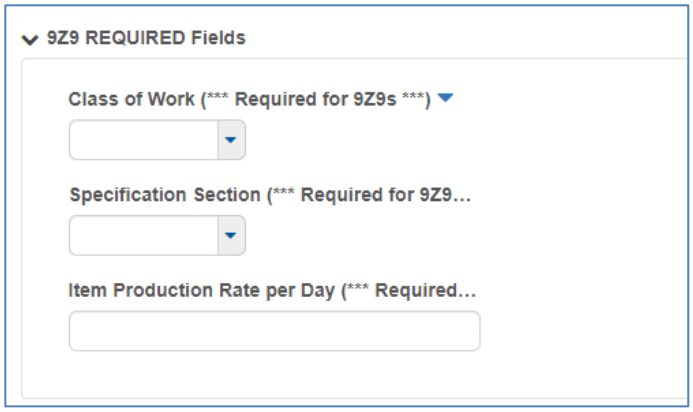


Figure 12: 9Z9 Required Fields

a. Select the class of work from the drop-down list in the Class of Work field. This selection will classify the work type the bid item falls under. See the Prequalification Reference Form for detailed descriptions about each class of work. The standard bid item list on the Standard Specifications page includes the class of work for all ODOT standard bid items.

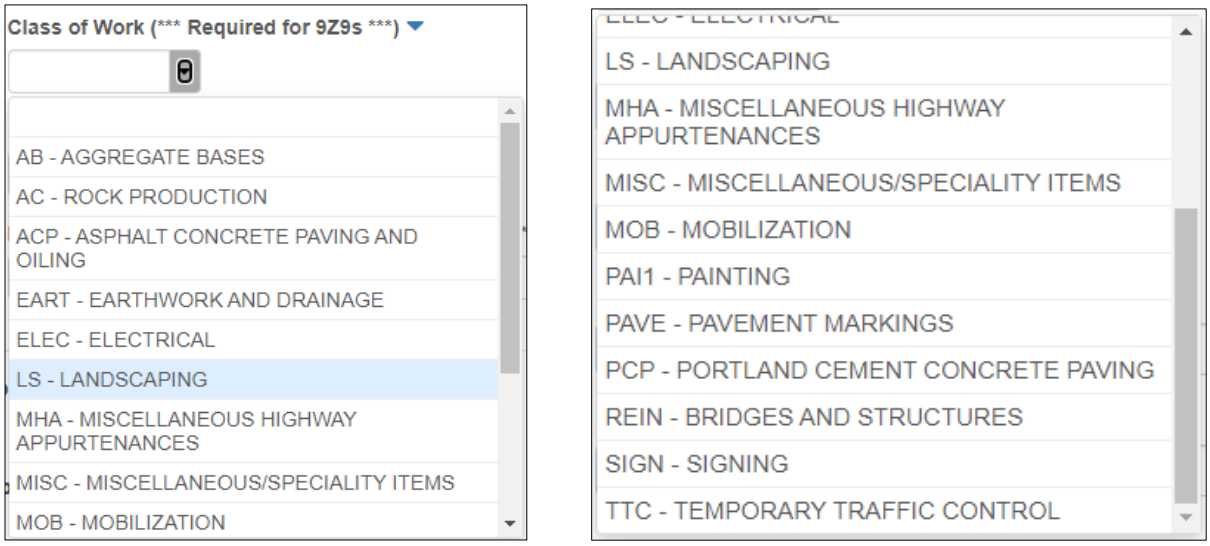


Figure 13: Class of Work List

b. Select the specification section related to the 9Z9 bid item from the drop-down list in the Specification field.
c. Enter the production rate per day (numerical value) in the Item Production Rate per Day field.
    i. The production rate can be changed for standard bid items, but the person who changed it is responsible for that rate for the project. Production rates that are too high and not attainable will result in claims for the project. You must consult with

production rate experts prior to making significant rate adjustments. The Class of Work and Specification Section cannot be changed for standard bid items.

d. Select "Save."

If you do not enter the class of work, specification section or production rate, the program will pop up with an error message letting the user know the bid item was not saved because the COW items were not entered.

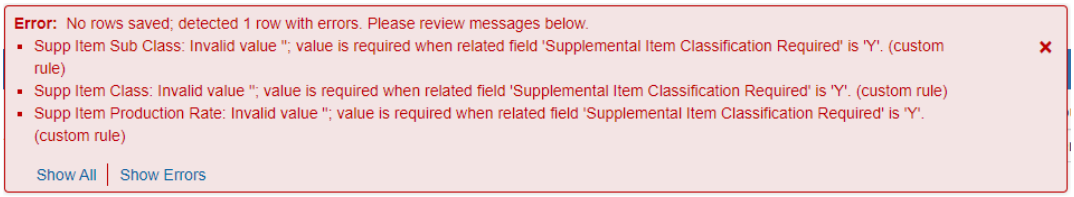


Figure 14: Error Message

Once the class of work, specification section and production rate are entered, the program will pop up with a message the save is complete.

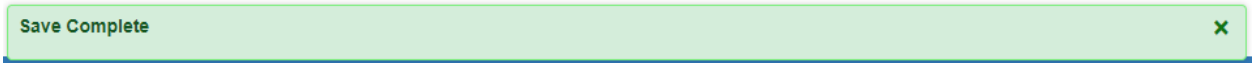


Figure 15: Save Complete Message

The fuel and steel escalation information are only required if the miscellaneous (9Z9) pay items uses considerable fuel and/or steel. **If a field is not needed for the bid item, leave blank.** DO NOT enter zero (0).

1. Navigate to the miscellaneous (9Z9) bid item. Click on the bid item to expand the bid item information.
2. Fuel Escalation: FHWA provides a list of acceptable pay items that may qualify for fuel escalation. Contact the PCO Cost Estimators to verify if the miscellaneous (9Z9) bid item qualifies for fuel escalation. If the item qualifies for fuel escalation, the PCO Cost Estimator will supply the fuel escalation fuel factor and fuel escalation conversion factor.

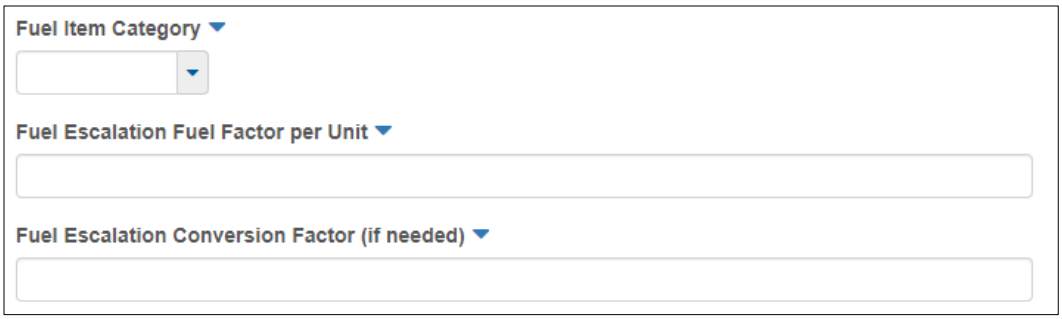


Figure 16: 9Z9 Bid Item Fuel Escalation

a. Fuel Item Category – chose the category most closely related to the miscellaneous (9Z9) bid item.
b. Fuel Escalation Fuel Factor per Unit – use value supplied by PCO Cost Estimator
c. Fuel Escalation Conversion Factor – use value supplied by PCO Cost Estimator

3. Steel Escalation:

Figure 17: 9Z9 Bid Item Steel Escalation

a. Weight of Steel per Unit – enter the total weight (lbs) of the estimated steel for the 9Z9 bid item.
b. Steel Escalation Class – enter the class of steel.
    - Class 1 – Pipe (arch, ductile, structural, and other plates)
    - Class 2 – Furnish piling (all shapes)
    - Class 3 – Bridge (girders, beams, and steel maintenance)
    - Class 4 – Rebar (coated and uncoated)
    - Class 5 – Railing
    - Class 6 – Guardrail, metal barriers, cable guardrail (cable cost excluded)
    - Class 7 – Sign structures and light poles
c. Steel Escalation Qualifying Unit Cost – enter the dollar amount per pound of the miscellaneous (9Z9) steel material. This does not include the labor and equipment costs associated with the bid item. The Project Controls Office Cost Estimators can assist with selecting a value.
d. Select "Save."

Categories

In Estimation, a "Category" 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" ACP and concrete walks, among others. **Each structure must have its own category** and all the items (temporary and permanent) associated with that structure must use the same category. When unsure if an item should use a structure category, contact the Project Controls Office.

Standard category numbers are:

- Category 0200 – Temporary Features and Appurtenances
- Category 0300 – Roadwork
- Category 0400 – Drainage and sewers
- Category 0500 – 0599 – All structures except traffic signal structures using 0931-0950
    - Cast-in-Place Structures
    - Pre-Cast Structures
    - Retaining Walls
    - Steel Structures
    - Sound Walls
- Category 0600 – Bases
- Category 0700 – Wearing Surfaces
- Category 0800 – Permanent Traffic Safety and Guidance Devices
- Category 0900 – Permanent Traffic Control and Illumination Systems
    - Category 0931-0950– All major sign support structures with assigned structure numbers
- Category 1000 – Right-of-Way Development and Control
- Category 1100 – Water Supply Systems
- Category 1200 – Added Bid Items
- Category 9400 – Anticipated Additional Items
- Category 9800 – Construction Engineering

It is important the correct category number is used to ensure the Structure Items function of the Fuel Escalation, Steel Escalation, and Class of Work worksheet work properly.

Use the following directions to add a category:

1. Navigate to Cost Estimate Summary
2. Select Categories

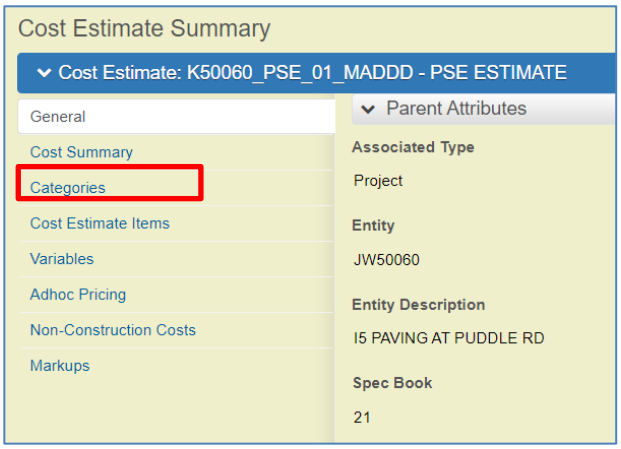


Figure 18 - Location of the Categories in the Cost Estimate Summary

3. To add a Category:
    a. Click New
    b. Enter Category (number) and Category Description
        i. If the new category is a structure, the category description must include the structure number.

Figure 19 Adding Category

    c. Click Save

4. To copy a Category:
    a. Select the blue Action Arrow on the category you want to copy.

Figure 20 - Copying a Category

    b. Select Duplicate Row

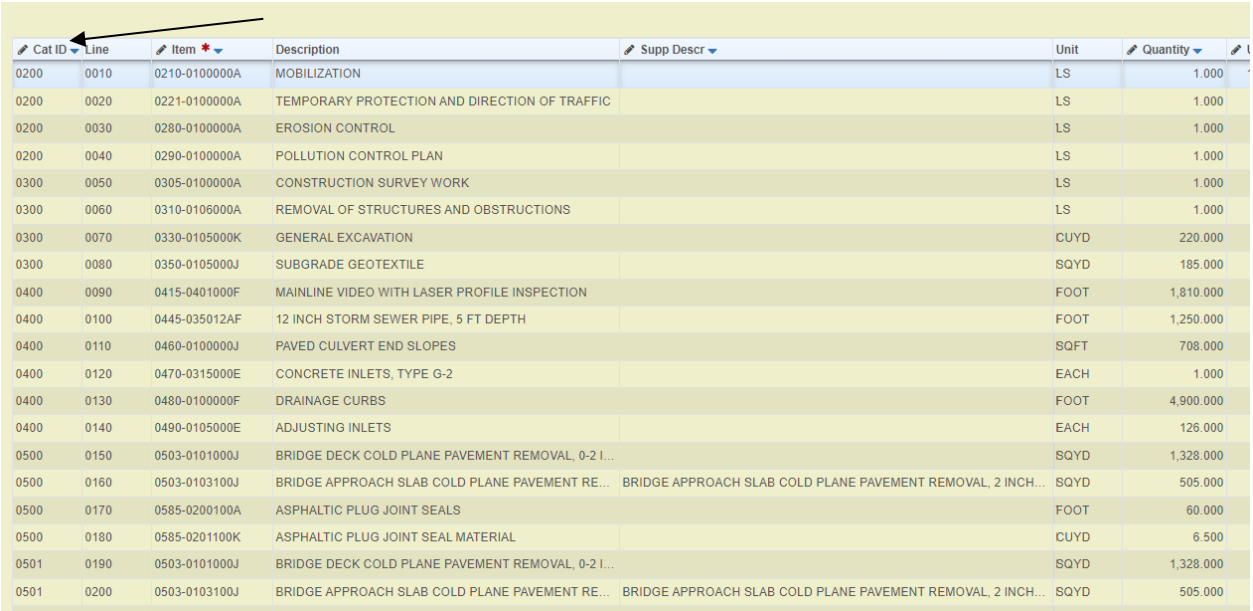
c. Enter the Category (number) and the Category Description

Figure 21 - Assigning a category number

d. Click Save

The CAT ID column of the Item Pricing Worksheet will automatically be filled in with the inferred category. If there are multiple structure category groups, the correct category will need to be manually inputted in the CAT ID column of the Item Pricing Worksheet.

1. Navigate to the Item Pricing Worksheet.
2. Select the category you want to change.



Cat ID	Line	Item *	Description	Supp Descr	Unit	Quantity
0200	0010	0210-0100000A	MOBILIZATION		LS	1.000
0200	0020	0221-0100000A	TEMPORARY PROTECTION AND DIRECTION OF TRAFFIC		LS	1.000
0200	0030	0280-0100000A	EROSION CONTROL		LS	1.000
0200	0040	0290-0100000A	POLLUTION CONTROL PLAN		LS	1.000
0300	0050	0305-0100000A	CONSTRUCTION SURVEY WORK		LS	1.000
0300	0060	0310-0106000A	REMOVAL OF STRUCTURES AND OBSTRUCTIONS		LS	1.000
0300	0070	0330-0105000K	GENERAL EXCAVATION		CUYD	220.000
0300	0080	0350-0105000J	SUBGRADE GEOTEXTILE		SQYD	185.000
0400	0090	0415-0401000F	MAINLINE VIDEO WITH LASER PROFILE INSPECTION		FOOT	1,810.000
0400	0100	0445-035012AF	12 INCH STORM SEWER PIPE, 5 FT DEPTH		FOOT	1,250.000
0400	0110	0460-0100000J	PAVED CULVERT END SLOPES		SQFT	708.000
0400	0120	0470-0315000E	CONCRETE INLETS, TYPE G-2		EACH	1.000
0400	0130	0480-0100000F	DRAINAGE CURBS		FOOT	4,900.000
0400	0140	0490-0105000E	ADJUSTING INLETS		EACH	126.000
0500	0150	0503-0101000J	BRIDGE DECK COLD PLANE PAVEMENT REMOVAL, 0-2 I...		SQYD	1,328.000
0500	0160	0503-0103100J	BRIDGE APPROACH SLAB COLD PLANE PAVEMENT RE...	BRIDGE APPROACH SLAB COLD PLANE PAVEMENT REMOVAL, 2 INCH...	SQYD	505.000
0500	0170	0585-0200100A	ASPHALTIC PLUG JOINT SEALS		FOOT	60.000
0500	0180	0585-0201100K	ASPHALTIC PLUG JOINT SEAL MATERIAL		CUYD	6.500
0501	0190	0503-0101000J	BRIDGE DECK COLD PLANE PAVEMENT REMOVAL, 0-2 I...		SQYD	1,328.000
0501	0200	0503-0103100J	BRIDGE APPROACH SLAB COLD PLANE PAVEMENT RE...	BRIDGE APPROACH SLAB COLD PLANE PAVEMENT REMOVAL, 2 INCH...	SQYD	505.000

Figure 22 - Categories are assigned on the far left column of the Item Pricing Worksheet

3. Begin typing the category number or name to search.
4. Select the category.
5. Click Save.

Non-Biddable Items

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. Anticipated items are required for any items listed in Anticipated Item Requests (AIRs) or Letter of Public Interest Findings (LPIF). All anticipated items need to be identified and approved by PCO through the LPIF process prior to submitting PS&E to PCO. See the LPIF Guidance for more information. The use of anticipated items is acceptable when there is a high likelihood that non-biddable costs 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.
- Work Zone Safety Monitoring / Traffic Oversight

Do not include any project work items that can be identified, quantified, or designed and bid as a common biddable 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.

For more information on anticipated items, refer to Operational Notice PD-07 and the PS&E Delivery Manual.

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 to add.

ODOT has established several escalation clauses for specific commodity pricing (fuel, asphalt, and steel escalation). These clauses help account for unforeseeable cost changes that may arise during the construction phase of a project. For example, 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 of fuel drops.) They will then indicate in the specifications section which escalation clauses to add.

Follow the directions below to add anticipated items in Estimation.

1. Navigate to the Item Pricing Worksheet
2. Click Select Items…
    a. Search the available anticipated items (all start with 9400-)
    b. Select the most appropriate anticipated item.
3. Click Add to Cost Estimate
4. Add "1.0" for the Quantity
5. Enter supplemental description in "Supp Descr" if needed.
    a. The supplemental description must match the name of the anticipated item specified in the approved AIRs or LPIFs and all of it must be capitalized. Any information in the supplemental description column will appear on the estimate.
6. Add the cost of the anticipated item in Unit Price
    a. The unit price must be within $5,000 of the amount specified in the approved AIR or LPIF.
7. Click Save

Engineering

The Engineering item is the non-biddable item used in the Construction Engineering category. The Engineering item is used to include the cost of administering the construction contract after the project bids. Estimation has various reference prices available based on the guideline established in PD-08, however the estimated price used in the estimate needs input from the construction contract administrator to ensure the estimate includes all expected costs (i.e. per diem, survey, consultant work order contracts). The Engineering amount in the cost estimate does not set the final amount authorized for Engineering. The final Engineering amount is determined by the construction contract administrator after the project bids and is submitted to OPO-CCU.

Assigning Contingencies

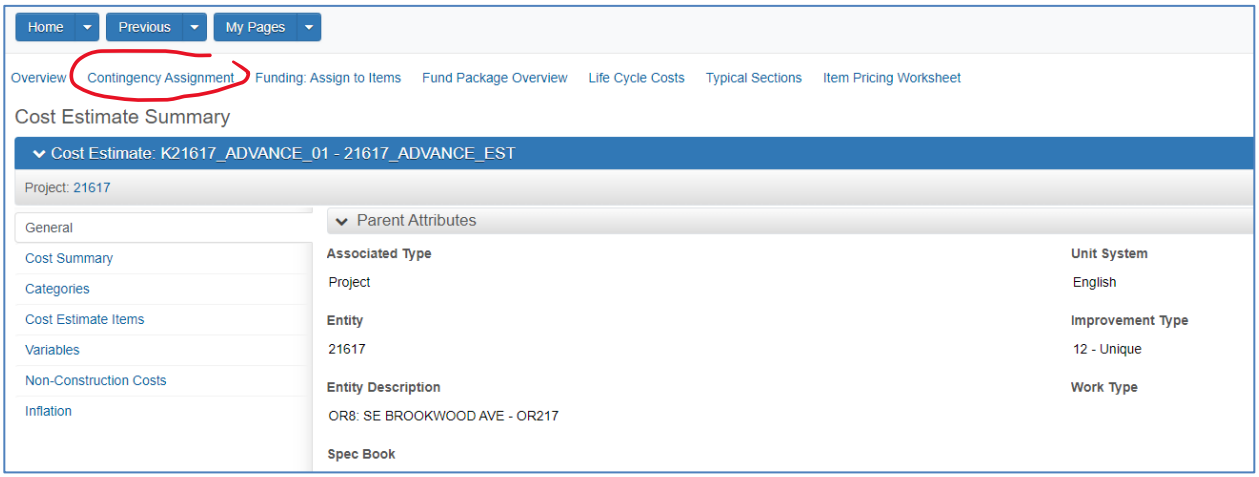


Figure 23 - Location of the Contingency Assignment

Construction Contingency

Per PD-08 it is recommended to have 3.5% of contingency for applicable use during construction to account for minor errors, informalities, and or opportunities that may arise during construction.

Each project delivery cycle from Scoping- Award will carry 3.5% contingency for construction.

Design Contingency

When building estimates at earlier stages of a project (i.e. at preliminary or advance stage), it may be warranted to use a contingency of a higher percentage to better reflect the incomplete nature of the project at that stage. Design contingency is design progression funds that the team knowingly sets aside monies for scopes that are not yet fully designed. These funds will be replaced with actual bid item work in the upcoming phase deliverables. At PSE design contingency will be automatically set to $0.00. At PSE the bid quantities, items, and prices should be complete and represent current market trends.

Contingency Adjustments

Use the following steps to adjust contingency.

1. Click on either Construction or Design to make modifications to each applicable section.

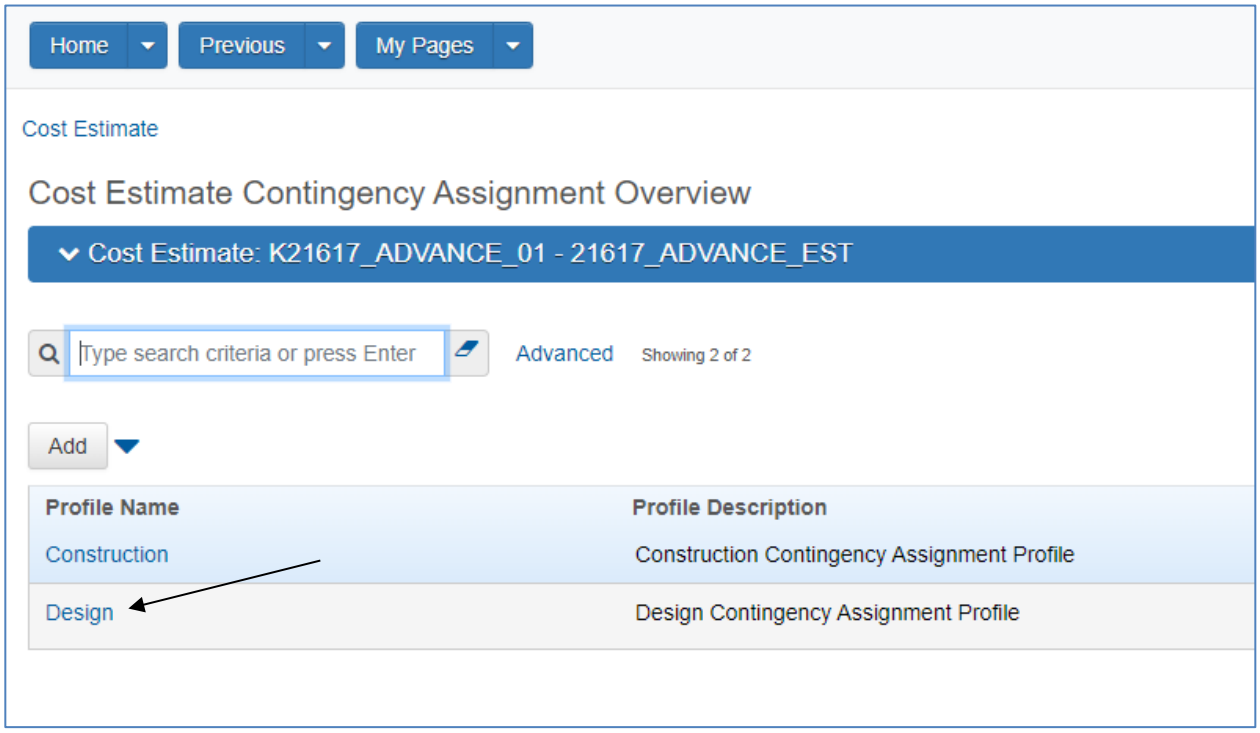


Figure 24 - Cost Estimate Contingency Assignment

The current estimate phase is listed and showing the total contingency calculated for the Contingency Profile Cost in the upper right.

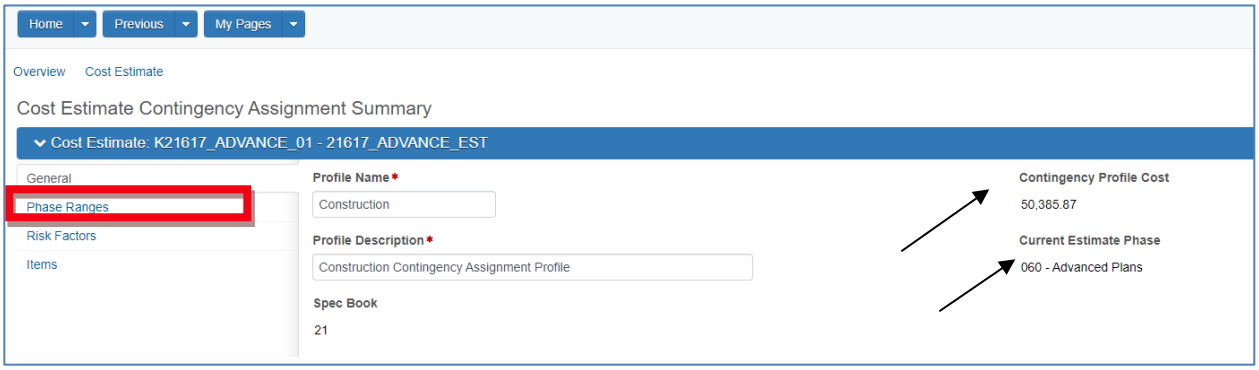


Figure 25 - Phase Contingency Information

2. To adjust click "Phase Ranges."

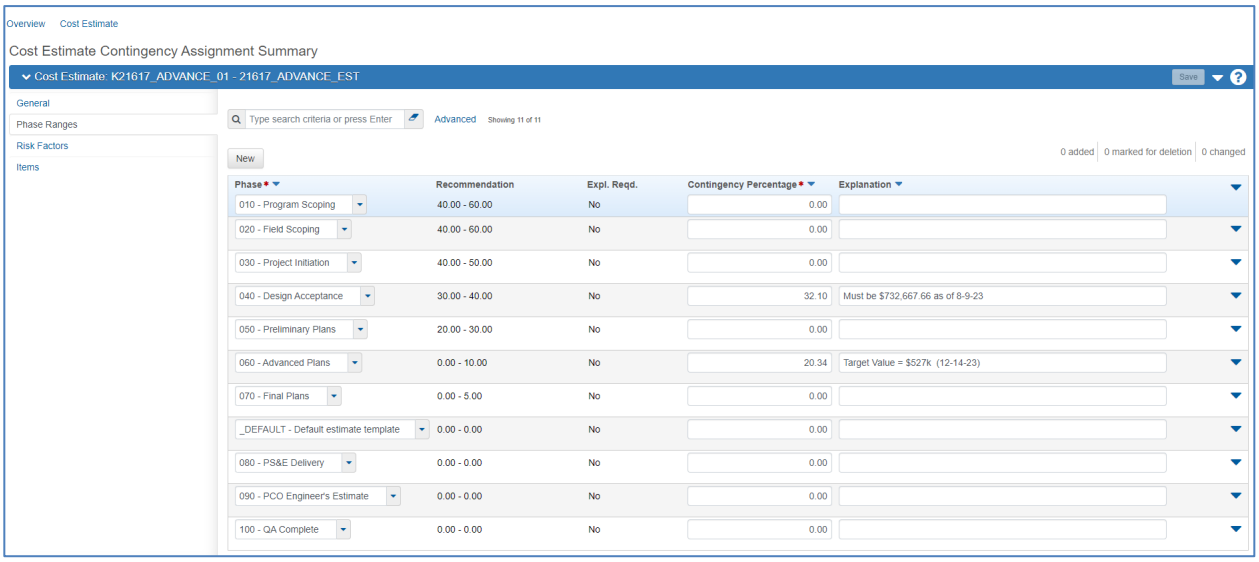


Figure 26 - Contingency Assignments Based on Phase

Here you will see all phases that are listed in project delivery. Each phase has a recommended phase range associated with each phase. Adjustments can be made and should be noted in the explanation field. Contingency will only be calculated in the estimate with the applicable "Phase" of estimate.

3. Enter the desired contingency percentage with the corresponding "Phase" of estimate. Leave brief explanation if outside range and "Save."

Non-Construction Costs

Non-Construction Costs are cost items that are not associated with the "CN" Phase of the estimate but rather the total cost of the project. Non-Construction costs are the following:

- PE- Preliminary Engineering
- ROW- Right of Way
- PL- Planning
- UR- Utility Relocation
- OTH- Other Phase

These items are estimated during scoping of a project. At project initiation these phase estimates should be changed from percentage-based estimate to actual fixed dollars to mirror the budget of each phase in the STIP.

Inflation

Inflation can be added separately (rather than by contingency) to an estimate. Inflation should reduce to $0.00 at PS&E. ODOT Finance and Budget Division maintains an Inflation Calculator available to ODOT staff.

1. Click Inflation as shown on the cost estimate summary page, as shown below.

Figure 27 - Location of Markups

2. Click "New" to add inflation to your estimate.

Figure 28 - Adding Inflation to an Estimate

3. In the supplemental description enter the description of the inflation. Example Midpoint of construction 2027.
4. Enter the calculated inflation amount desired into the amount field and click save in the upper right-hand corner.

Bid Item Pricing

All biddable items need to be assigned an estimated price. Estimation allows users to use reference, bid-based (regression), and ad hoc pricing.

Reference Pricing

Reference prices include the following:

- Default pricing assigned to a pay item's attributes in Estimation. Default prices are reviewed and adjusted periodically by the Estimating Unit and are only for those items that are not typically subject to price changes based on scope or quantity (i.e. flaggers).
- User-created reference price (such as a price provided by a designer or used from another project)
- Default or user-created percentage-based pricing based on the overall cost estimate. (strongly recommended for mobilization, and used in early project development for items such as traffic control, erosion control, construction survey, engineering)

Use the following instructions to use reference pricing.

1. Select 3 blue lines in Unit Price 
2. Select Reference

Figure 29 Reference Pricing

3. Enter select or create the reference price.

"Percent of" box is used to add a percentage of cost of the biddable items. "Percent on top" is used to add a percentage of cost of the total estimate and is not recommended to be used.

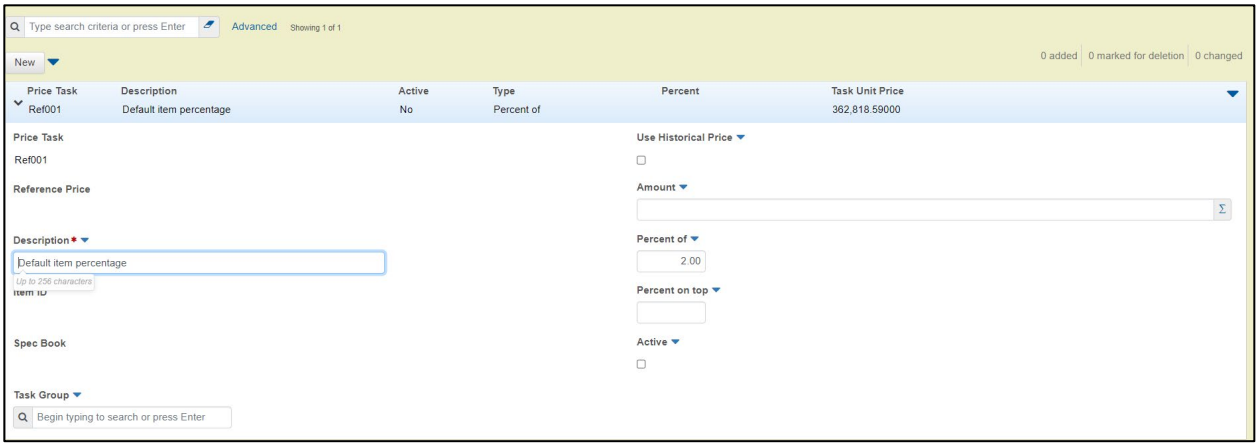


Figure 30 - Reference Price Selection

4. Make sure Active is checked.

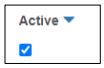


Figure 31 Active Check box Click Save

5. If the amount box is greyed out with dollar amounts, then this is an assigned price task to an item that has coded calculations to create the sum.

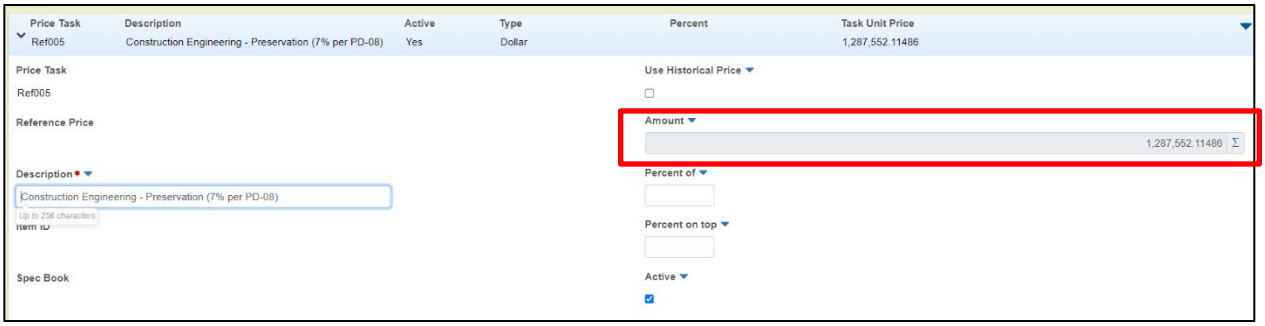


Figure 32 - Coded Expressions in the Reference Price

By hitting the summation sign in the amount field, you can see the Iron Python Code. These price task calculations are used to create a calculation in the system that would otherwise create errors due to circular calculations.

Bid-Based Regression Pricing

Estimation can access previous bid information and perform statistical computations for regression pricing using a particular bid history profile (i.e. 6-month, 1 year, 3 year) that can be set in the General tab of the cost estimate. Users need to be cautious relying solely on regression pricing. Estimation

cannot distinguish the particular scope of work or unique market conditions and data may be skewed by unbalanced bid price data.

Follow these steps to use bid-based regression.

1. Select 3 blue lines in Unit Price
2. Check the box for Bid Based

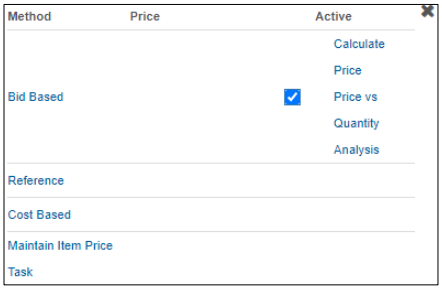


Figure 33 Bid Based Pricing

3. Click Save
4. Select 3 blue lines in Unit Price
5. Click Calculate Price

The bid data being used for the regression pricing can be filtered using the Price vs Quantity Pricing feature.

1. Select 3 blue lines in Unit Price
2. Check the box for Bid Based

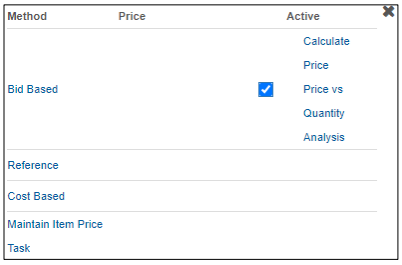


Figure 34 Check Bid Based Box

3. Click Save
4. Select 3 blue lines in Unit Price
5. Click Price vs Quantity Analysis

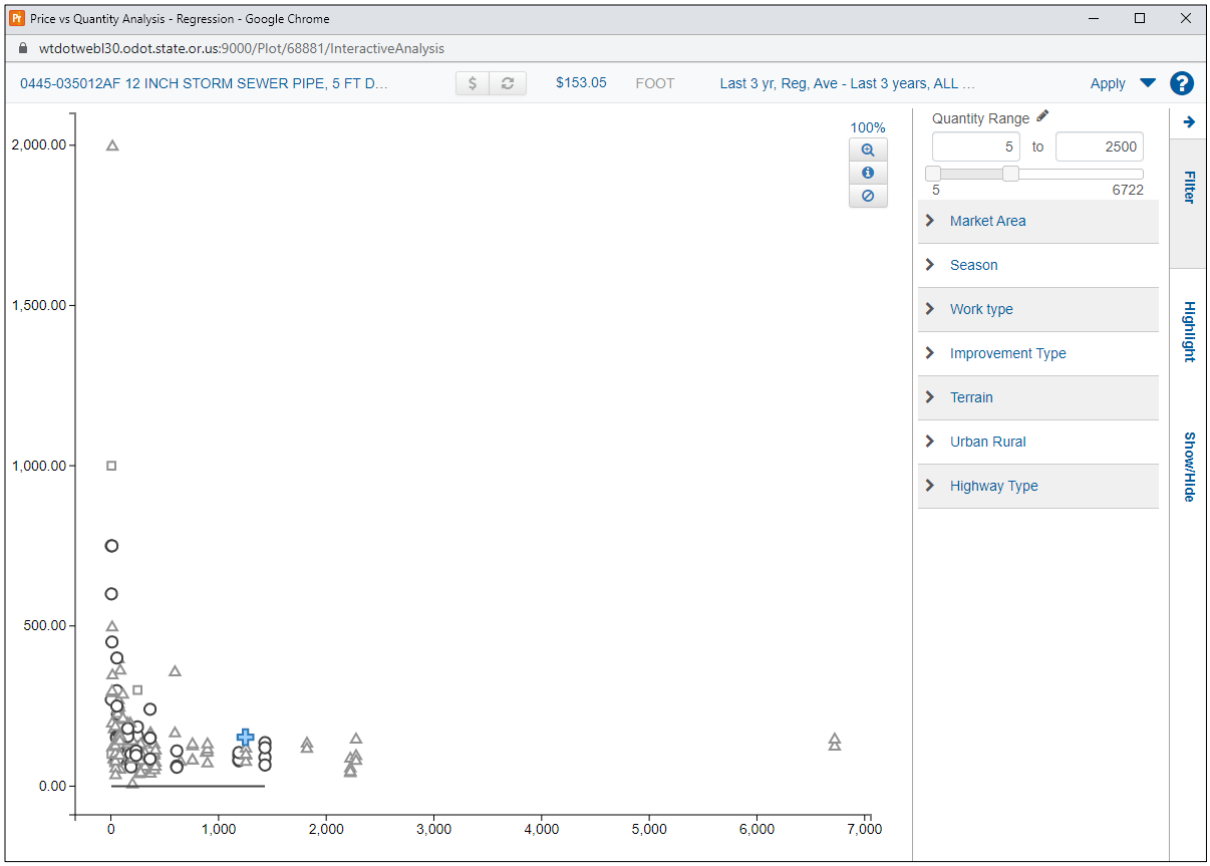


Figure 35 Price vs Quantity Analysis

6. Adjust filters as needed.
7. Click Apply to use price proposed at top.

Ad Hoc Pricing

An ad hoc price is when an item's price estimate is entered directly into Estimation without using a reference or bid-based regression price. Ad hoc pricing is required when finalizing estimates once the scope and market conditions of the project are well understood (excluding mobilization) and the non-bid item amounts are final. Ad hoc pricing is an indicator that the item price has been reviewed and finalized. Ad hoc pricing locks in the price estimate because it cannot change like reference or bid-based regression pricing can.

Cost Estimate Summary Report

A cost estimate summary report in Estimation produces a PDF document containing the information in a cost estimate. This report provides a summary and detailed breakdown. These reports are stored in ProjectWise as deliverables for each milestone, however the deliverable PS&E estimate is ensuring the estimate is in AWProject. (see example in Appendix A)

Section 4 – Using Cost Estimates for Preparing Bid Documents

PS&E cost estimates are used to prepare the initial schedule of bid items, determine the project's class of work, and determine the eligibility of item for payment adjustments.

Using the Fuel Index and Scheduling Program

The Fuel Index and Scheduling Program uses the construction cost estimate data exported from Estimation to determine the project's class of work, the pay items that qualify for payment adjustment due to escalation or de-escalation of fuel and steel prices, and generates a construction time schedule.

The Fuel Index and Scheduling Program – Estimation zip file folder is located on the AASHTOWare Estimation web page in the Quick Reference Guide Table. These files may be updated often. It is recommended to download the file at least every month to obtain updates. The most current version of the program should be re-run after the PS&E cost estimate is completed.

Figure 36 - Location of Fuel Index and Scheduling Program

DO NOT change the name of the two files in the zip file folder. If the file names are changed, the MS Project file for the Construction Time Schedule cannot find the data to be transferred.

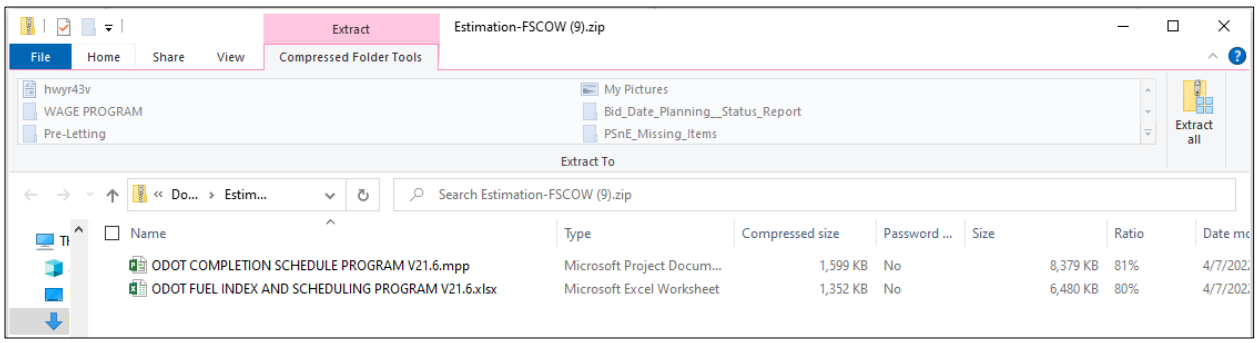


Figure 37 - Example of Files in the Fuel Index and Scheduling Program

Construction Schedules

The construction time schedule (CTS) is used to develop an approximate contract completion date. The construction schedule is created by the designer of the project or the specification writer.

The construction schedule needs to show the bid date, completion date and the time needed to complete major construction components of the project. Update this document when you revise the estimate. It is highly recommended that the resident engineer reviews the schedule to ensure it is achievable. The project team is responsible for keeping the official copy of the construction schedule within ProjectWise, in accordance with ODOT's retention schedule (typically through completion of the project.) The schedule template is embedded in the Fuel-Index-Scheduling-Program-Zip located on the PCO website under resources.

Build the construction schedule with the following items in mind:

- Use quantities from the project estimate downloaded from Estimation.
- 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 Section 00290 (Work-In-Water, Noise, Environmental) limitations. Sections 00220 (Lane Closures, Nighttime – Daytime 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 shutdown be required? If so, how long?
- PCO has provided a baseline for production rates, and those rates may require adjusting based on the project needs.

Section 5 – Managing Estimates

Distribution and Review of Estimates

Distribution of Estimates

During the final phases of project development, the project team helps develop 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 web pages or communicated to the public or to contractors when discussing the project. Programmed budgetary numbers from STIP are disclosed through ODOT's contract report and reflect a budget including the biddable items, construction engineering, contingency, etc. If this budgetary number is discussed outside of the project team, you should take care to note that these components are included.

Transportation project managers will manage the distribution of estimates.

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 region staffing and procedures.

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 to expect that unit prices and quantities change in a reasonable manner over the course of the project. The lead designer, specifications writer, or transportation project manager should develop expertise in this review.

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

Engineer's Estimate

The Project Controls Office reviews the PS&E estimate for quality assurance after PS&E submittal and then produces the official Engineer's Estimate (EE) immediately before bid opening. A PCO estimator prepares the EE by adjusting unit costs on the PS&E estimate for current market trends, competition, location, etc. The EE includes any bid schedule changes that occur during the PCO quality assurance review period and addenda that may occur during advertisement.

Upon completing an EE, the PCO estimator will send the area manager and the project manager a summary comparing the EE to the PS&E estimate. The summary includes an estimated construction budget (includes biddable items, construction engineering, anticipated items, and construction contingency).

After a project bids, the EE is used as the basis for bid analysis and award procedures according to Operational Notice PD-08.

Section 6 – Cost Estimate Quality Control

ODOT cost estimates prepared in Estimation automatically convert into the schedule of items (aka bid schedule) after submittal to PS&E. Understanding the relationships of the items in the bid schedule to the other bid documents (plans and specifications) is a critical in preparing quality bid documents. This section covers key considerations and common mistakes in ODOT cost estimates.

Scoping Estimates

Unit Pricing

Scoping estimates should use current market pricing for unit pricing. Inflation and risk should not be included in the unit price but rather will be separate as contingency and inflation.

Percentage-Based Pricing

Percentage-based estimating is common during scoping for mobilization, traffic control, erosion control, construction survey, and construction engineering. The estimated costs should be carefully reviewed to make sure that the price is realistic. For example, construction survey and erosion control can be significantly overestimated for paving preservation project.

Project Development Estimates

General Estimate Setup

Estimates developed in Estimation may not calculate correctly if not properly setup.

Common Estimation Issues:

- Estimate phase not set correctly.
- Estimate is not set to a "Merged" estimate.
- Estimate still has reference (fixed, or percentage-based) pricing. Unit price values need to be "Ad hoc" (except mobilization) when finalizing an estimate, otherwise these final estimates will keep repricing as they are processed and also cause issues with other calculations in Estimation.
- Structure categories are not set up correctly. Remember every structure gets its own category number and description identifying the name and structure number.
- Structure categories are missing items. Structure items not associated with Part 00500 or Part 0900 (for major sign supports structures) must be assigned to their structure category. (i.e. temporary work access/containment, temporary bridges, bridge markers, protective screening.)
- Supplemental descriptions are not used correctly. When the bid schedule is generated, only the supplemental description is displayed if present.
- Cannot use the same pay item name twice, without either assigning to a different category or providing a unique supplemental description.

Quantities

Quantities in the estimate (and eventually bid schedule) need to match the quantities shown in the plans and listed in the special provisions so that bidders can appropriately proportion fixed costs in their unit price. If the quantities do not match, bidders will have difficulty providing a reasonable price and may need to unbalance their bid prices. Chapter 1302.9.2 of the Highway Design Manual discusses the relationship between construction notes and the estimate.

Common quantity issues:

- Quantities are incorrect:
  - Entered incorrectly.
  - Not updated.
  - Did not use the method of payment measurement to determine quantity.
- Quantities are rounded or inflated:
  - Traffic Control items like flagging and TCS.
  - Earthwork.
  - Drilled shaft lengths.
- Quantities can't be determined:
  - Earthwork quantities (for areas where earthwork is paid for separately) are not shown in plans or do not match.
- Quantities based on weights and proportions are not accurate:
  - Compacted unit weights of materials such as aggregate base and ACP can vary significantly (for example in Central Oregon, compacted ACP can range from 137 to 152 pounds per cubic foot).
  - The weight of Asphalt binder is paid separately when using Section 00745. The weight is determined as a percentage of the ACP weight, typically set at 6%, but can ranged between 5-7% depending on the mix design.
  - The ODOT construction office and construction QA group will have information for compacted weights and asphalt binder percentages for material sources that will likely be used for projects.

Unit Pricing

Cost estimates should use current market pricing for unit pricing. Contingency factors are used to separately to handle inflation or price uncertainty.

Common Unit Pricing Issues

- Unit pricing is not adjusted for small quantity/low production work where fixed costs may significantly impact the unit prices.
  - ACP construction in thin strips or just at bridge ends.
  - Drilled shafts.
  - Contaminated soil disposal.
  - Permanent Seeding.
  - Electrical work.

- Pricing using bid data that is often unbalanced.
    - Section 00745 ACP and asphalt binder bid data is often skewed because the asphalt binder price often receives a token bid and instead that price is included in the ACP price. (so instead of ACP-$65/ton, asphalt binder $600/ton, bidders will bid ACP $100/ton, asphalt binder $0.01/ton)
- Unit pricing not considering design and specifications.
    - Seed mixes and planting establishment periods.

Percentage-Based Pricing

Percentage-based estimating is common during scoping for mobilization, traffic control, erosion control, construction survey, and construction engineering. The estimated costs should be carefully reviewed to make sure that the price is realistic. For example, construction survey and erosion control can be significantly overestimated for paving preservation project. By Advanced Plans phase, percentage-based pricing should not be used, except for Mobilization.

Common Percentage-Based Pricing Issues

- Mobilization – the payment of mobilization typically dictates this price, which is 10 "percent of" the biddable items (including mobilization). Setting the percentage to "percent on top" will result in underestimating this item.
- TPDT – this item should be a fixed price item provided by the traffic control designer once specific bid items are developed.
- Erosion Control – this item should be a fixed price item once specific bid items are developed.
- Construction Survey – this item should always be a fixed price item, otherwise it can be significantly under or over estimated.
- Construction Engineering – PD-08 provides guidelines for estimating this item, using a percentage-based formula which is embedded in the reference prices in Estimation. However, the value needs to be vetted, considering what the construction administrator needs, considering any unique inspection requirements, travel, consultant work orders, and right of way monumentation.

Unit of Measure

Several ODOT pay items have more than one unit of measure. Estimates need to match the unit of measure intended by the designer in plans and special provisions.

- Flagger Station Lighting – (each or hour)
- Removal of Pipes – (foot or hybrid lump sum)
- Clearing and Grubbing – (acre or hybrid lump sum)
- Preparation of Shoulders – (mile or hybrid lump sum)
- Structure Excavation – (cubic yard or hybrid lump sum)
- Structure backfills items – (cubic yard or hybrid lump sum)
- Reinforcement items – (pounds or lump sum)
- Structural concrete items – (cubic yard or hybrid lump sum)
- Aggregates items (cubic yards or tons)

Estimating Manual

- Crack Sealing (foot or pound)
- Curb items – (foot or cubic yard)
- Monolithic Curb and Sidewalk (foot or square foot)

Common Unit of Measure Issues

- Estimates commonly use the incorrect unit of measure when there are multiple measurement options.

Hybrid lump sum items

Hybrid lump sum items need estimated quantities values in the quantity field and not just "1.00". The quantity should match the estimated quantity listed in the .80 Measurement subsection of the special provisions or what are shown in the plans (i.e. illumination poles). AASHTOWare will automatically convert these items into lump sum pay items when the bid schedule is generated by the Project Controls Office.

Common Hybrid Lump Sum Issues

- Hybrid-lump sum pay items are commonly and incorrectly assigned a quantity of 1.00 instead of the estimated quantity for the units shown in Estimation.
    - Temporary bridges (detour, diversion, work)
    - Removal work
    - Bridge work and materials (bridge removal, excavation, backfill, concrete, rebar, joint materials)
    - Sign supports (footings, metal supports)
    - Illumination materials (pole foundations, switching/wiring/conduit)
- Several pay items have more than one form of measurement and payment and sometimes the wrong pay item code is selected:
    - Structure Excavation
    - Structural Concrete

Anticipated Items

Anticipated Items need to be correctly listed and calculated.

- Anticipated items names and values need to match those listed in the PCO-approved *Anticipated Item Request* or *Letter of Public Interest Finding* found in the Project Management folder in ProjectWise. The only exception are anticipated items for payment adjustments related to asphalt binder, fuel, and steel escalation.
- Statistical Bonus - when using 00745 asphalt paving specification and over 3,000 tons, the total price of the mixture (ACP + asphalt binder) is eligible for 5% bonus.
- ACP/PCC Smoothness Bonus – see SP00745 to see if eligible and which pricing schedule assigned ($300 or $500 per tenth lane mile qualifying according).
- Anticipated items for escalation are not required and are a business decision by the region.

Common Anticipated Item Issues

- Statistical and smoothness bonus amounts not updated with scope and pricing changes.
- Statistical ACP bonus calculate does not consider the cost of the asphalt binder.
- The anticipated item uses a "bid" item code, such as 1999 Miscellaneous instead of one of the 09400 codes required for "non-bid" anticipated items.
- The anticipated item supplement description does not match the approved description on the LPIF or AIR form approved by the PCO Manager.

Engineering (Construction Engineering)

Engineering (aka Construction Engineering) value should be finalized at PS&E (will be ad hoc or referenced to a fixed price, not the referencing the expression.

Common Engineering Item Issues

- The price is still using an expression (percentage-based) price at PS&E and does not actually reflect the amount estimated to be necessary to administer the project.
- The price is not accounting for consultant work order contract payments required during construction.

Miscellaneous Items

Unique items descriptions and unit of measure need to match the special provisions.

Missing required pay items

There are certain pay items that are required for all ODOT construction contracts and other secondary items that are required by the specifications but sometimes overlooked. Examples include:

- Pollution Control Plan
- Extra for Asphalt Approaches
- Signal Drilled Shaft
- Temporary Truck Mounted Attenuators
- Aggregate Base / ACP in conjunction with another spec like 00748 ACPR that says these materials are paid separately.

Unnecessary pay items

Unnecessary pay items that may not be needed based on the value or the scope of the work and contain a provision in the corresponding specification subsection titled *.90 Payment* stating:

"*When the Contract Schedule of Items does not indicate payment for Work under this Section, no separate or additional payment will be made. Payment will be included in payment made for the appropriate items under which this Work is required.*"

Estimating Manual

The ODOT Specifications Manual also discusses whether or not a pay item is needed when the work is minor and there is an option to not include a pay item. Certain specification provisions limit the applicability of certain pay items and use the phrase:

"No separate or additional payment will be made for …"

Pay items for work not shown in plans or the scope is vague:

Ensure that the bidding plans provide as much detail as possible to the scope of certain repair items and that the quantities of these items are not inflated.

- Subgrade Stabilization
- Asphalt Concrete Pavement Repair
- Trench Resurfacing
- Class 2 Preparation

Pay items not consistent with current precedence:

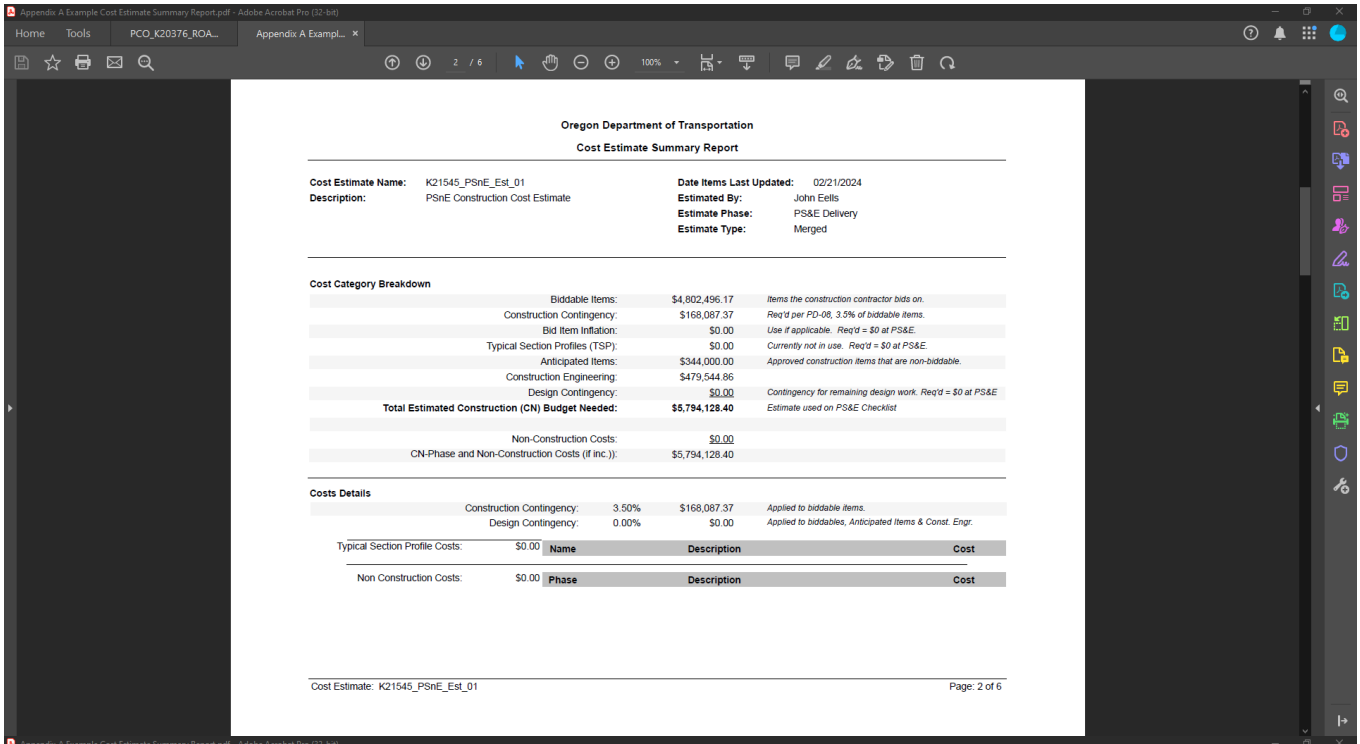
For example, the Removal of Surfacings for Curb Ramp Construction pay item was designed to cover all the different types of surfacings removal under a single pay item, especially for curb ramp projects, so we shouldn't see multiple surfacing removal pay items on these types of projects. Also related is earthwork, which for curb ramp projects, a pay item for earthwork is not necessary if it is only for building 00759 items like curbs, ramps, walks.

Conversion Issues

Common items not converted correctly to the measurement basis:

- Asphalt pavement saw cutting length is prorated for anything greater than 6" deep.
- Longitudinal pavement markings length is prorated for anything greater than 4" wide.
- Pipe video inspection length is both pre-installation video inspection and post installation and measured from structure to structure.
- Bid unit different than what the quantity value (i.e. someone forgets to convert SQFT to SQYD).
    - Bridge deck work contains surfacing removal items in SQYD but surfacing construction items in SQFT)
    - Aggregate base quantity from designer's model is in CUYD and they forget to convert to TON.

Appendix A – Example Cost Estimate Summary Report from Estimation



Oregon Department of Transportation

Cost Estimate Summary Report

Cost Estimate Name: K21545_PSnE_Est_01
Description: PSnE Construction Cost Estimate

Date Items Last Updated: 02/21/2024
Estimated By: John Eells
Estimate Phase: PS&E Delivery
Estimate Type: Merged

Cost Category Breakdown

Biddable Items:	$4,802,496.17	*Items the construction contractor bids on.*
Construction Contingency:	$168,087.37	*Req'd per PD-08, 3.5% of biddable items.*
Bid Item Inflation:	$0.00	*Use if applicable. Req'd = $0 at PS&E.*
Typical Section Profiles (TSP):	$0.00	*Currently not in use. Req'd = $0 at PS&E.*
Anticipated Items:	$344,000.00	*Approved construction items that are non-biddable.*
Construction Engineering:	$479,544.86	
Design Contingency:	$0.00	*Contingency for remaining design work. Req'd = $0 at PS&E*
Total Estimated Construction (CN) Budget Needed:	**$5,794,128.40**	*Estimate used on PS&E Checklist*
Non-Construction Costs:	$0.00	
CN-Phase and Non-Construction Costs (if inc.)):	$5,794,128.40	

Costs Details

Construction Contingency:	3.50%	$168,087.37	*Applied to biddable items.*
Design Contingency:	0.00%	$0.00	*Applied to biddables, Anticipated Items & Const. Engr.*

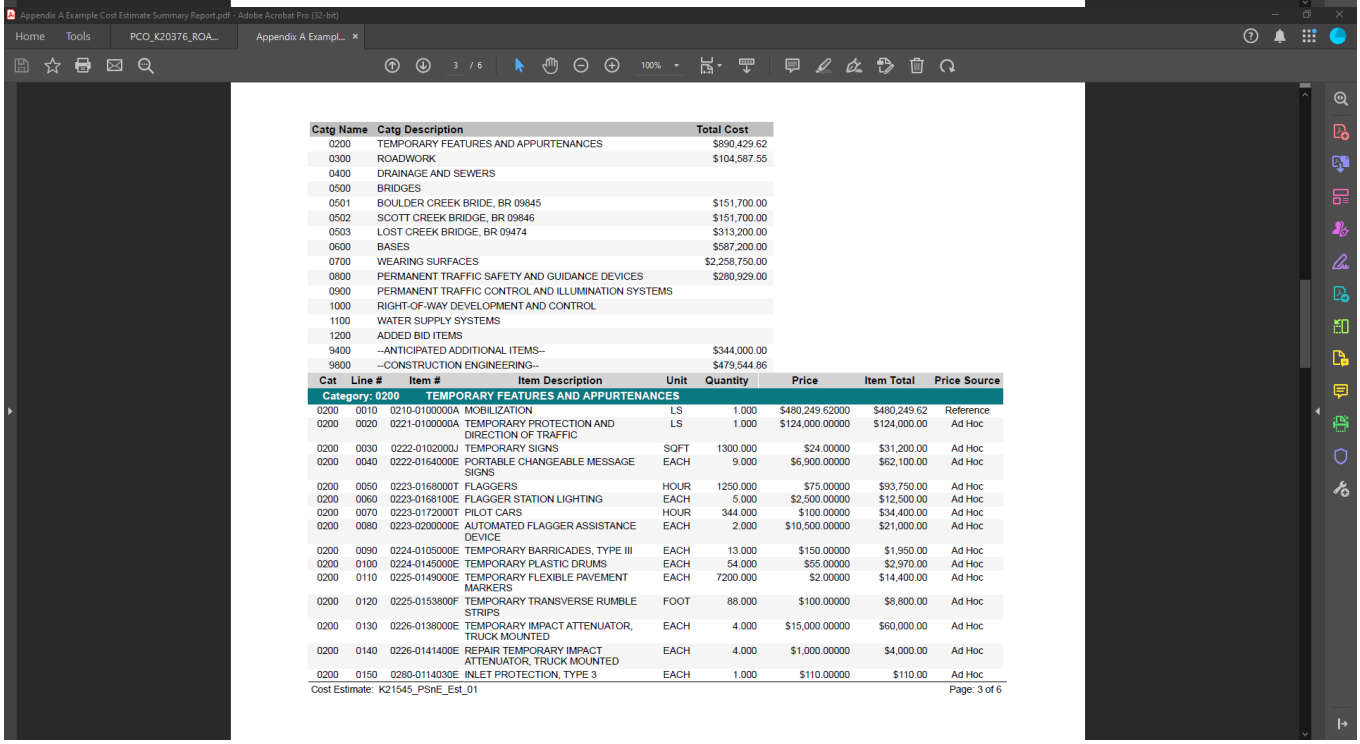
Typical Section Profile Costs: $0.00

Name	Description	Cost

Non Construction Costs: $0.00

Phase	Description	Cost

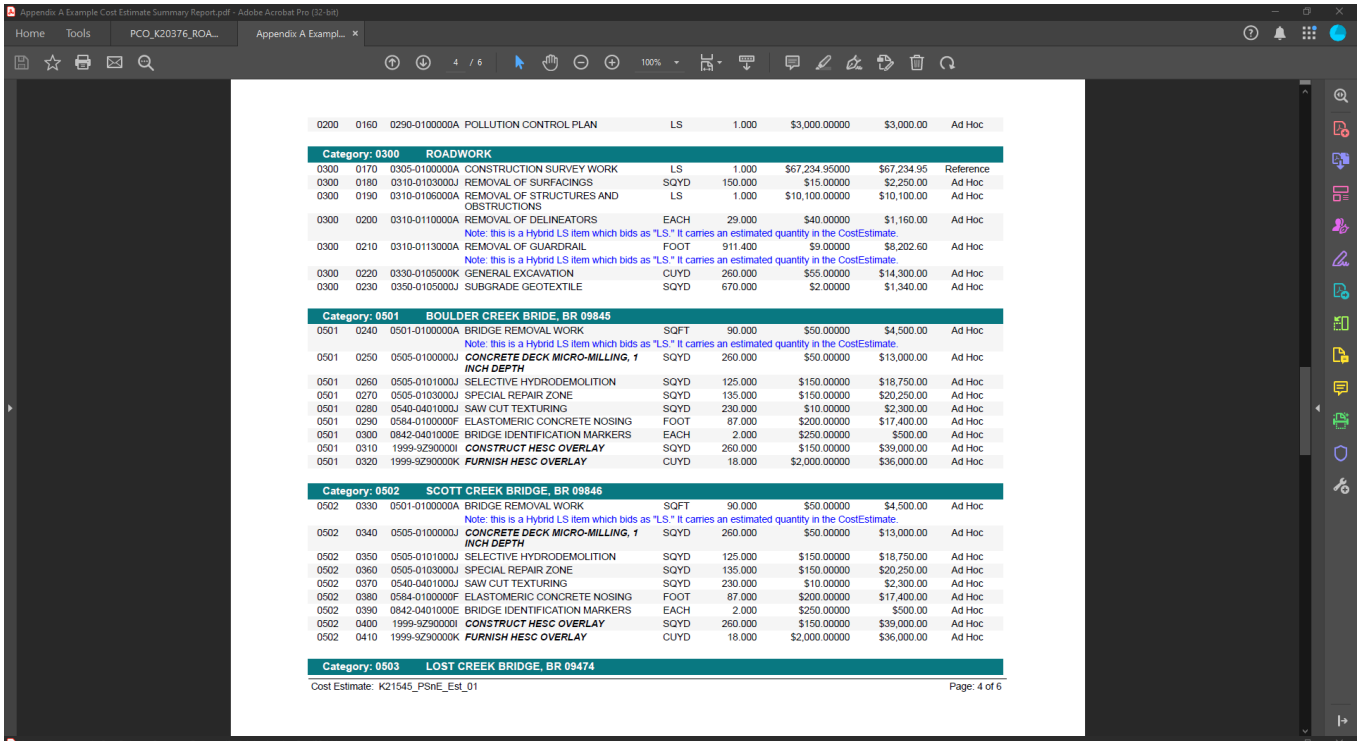
Cost Estimate: K21545_PSnE_Est_01 Page: 2 of 6



Catg Name	Catg Description	Total Cost
0200	TEMPORARY FEATURES AND APPURTENANCES	$890,429.62
0300	ROADWORK	$104,587.55
0400	DRAINAGE AND SEWERS	
0500	BRIDGES	
0501	BOULDER CREEK BRIDE, BR 09845	$151,700.00
0502	SCOTT CREEK BRIDGE, BR 09846	$151,700.00
0503	LOST CREEK BRIDGE, BR 09474	$313,200.00
0600	BASES	$587,200.00
0700	WEARING SURFACES	$2,258,750.00
0800	PERMANENT TRAFFIC SAFETY AND GUIDANCE DEVICES	$280,929.00
0900	PERMANENT TRAFFIC CONTROL AND ILLUMINATION SYSTEMS	
1000	RIGHT-OF-WAY DEVELOPMENT AND CONTROL	
1100	WATER SUPPLY SYSTEMS	
1200	ADDED BID ITEMS	
9400	--ANTICIPATED ADDITIONAL ITEMS--	$344,000.00
9800	--CONSTRUCTION ENGINEERING--	$479,544.86

Cat	Line #	Item #	Item Description	Unit	Quantity	Price	Item Total	Price Source
Category: 0200			**TEMPORARY FEATURES AND APPURTENANCES**					
0200	0010	0210-0100000A	MOBILIZATION	LS	1.000	$480,249.62000	$480,249.62	Reference
0200	0020	0221-0100000A	TEMPORARY PROTECTION AND DIRECTION OF TRAFFIC	LS	1.000	$124,000.00000	$124,000.00	Ad Hoc
0200	0030	0222-0102000J	TEMPORARY SIGNS	SQFT	1300.000	$24.00000	$31,200.00	Ad Hoc
0200	0040	0222-0164000E	PORTABLE CHANGEABLE MESSAGE SIGNS	EACH	9.000	$6,900.00000	$62,100.00	Ad Hoc
0200	0050	0223-0168000T	FLAGGERS	HOUR	1250.000	$75.00000	$93,750.00	Ad Hoc
0200	0060	0223-0168100E	FLAGGER STATION LIGHTING	EACH	5.000	$2,500.00000	$12,500.00	Ad Hoc
0200	0070	0223-0172000T	PILOT CARS	HOUR	344.000	$100.00000	$34,400.00	Ad Hoc
0200	0080	0223-0200000E	AUTOMATED FLAGGER ASSISTANCE DEVICE	EACH	2.000	$10,500.00000	$21,000.00	Ad Hoc
0200	0090	0224-0105000E	TEMPORARY BARRICADES, TYPE III	EACH	13.000	$150.00000	$1,950.00	Ad Hoc
0200	0100	0224-0145000E	TEMPORARY PLASTIC DRUMS	EACH	54.000	$55.00000	$2,970.00	Ad Hoc
0200	0110	0225-0149000E	TEMPORARY FLEXIBLE PAVEMENT MARKERS	EACH	7200.000	$2.00000	$14,400.00	Ad Hoc
0200	0120	0225-0153800F	TEMPORARY TRANSVERSE RUMBLE STRIPS	FOOT	88.000	$100.00000	$8,800.00	Ad Hoc
0200	0130	0226-0138000E	TEMPORARY IMPACT ATTENUATOR, TRUCK MOUNTED	EACH	4.000	$15,000.00000	$60,000.00	Ad Hoc
0200	0140	0226-0141400E	REPAIR TEMPORARY IMPACT ATTENUATOR, TRUCK MOUNTED	EACH	4.000	$1,000.00000	$4,000.00	Ad Hoc
0200	0150	0280-0114030E	INLET PROTECTION, TYPE 3	EACH	1.000	$110.00000	$110.00	Ad Hoc

Cost Estimate: K21545_PSnE_Est_01 Page: 3 of 6



0200	0160	0290-0100000A	POLLUTION CONTROL PLAN	LS	1.000	$3,000.00000	$3,000.00	Ad Hoc
Category: 0300			**ROADWORK**					
0300	0170	0305-0100000A	CONSTRUCTION SURVEY WORK	LS	1.000	$67,234.95000	$67,234.95	Reference
0300	0180	0310-0103000J	REMOVAL OF SURFACINGS	SQYD	150.000	$15.00000	$2,250.00	Ad Hoc
0300	0190	0310-0106000A	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	1.000	$10,100.00000	$10,100.00	Ad Hoc
0300	0200	0310-0110000A	REMOVAL OF DELINEATORS	EACH	29.000	$40.00000	$1,160.00	Ad Hoc
			Note: this is a Hybrid LS item which bids as "LS." It carries an estimated quantity in the CostEstimate.					
0300	0210	0310-0113000A	REMOVAL OF GUARDRAIL	FOOT	911.400	$9.00000	$8,202.60	Ad Hoc
			Note: this is a Hybrid LS item which bids as "LS." It carries an estimated quantity in the CostEstimate.					
0300	0220	0330-0105000K	GENERAL EXCAVATION	CUYD	260.000	$55.00000	$14,300.00	Ad Hoc
0300	0230	0350-0105000J	SUBGRADE GEOTEXTILE	SQYD	670.000	$2.00000	$1,340.00	Ad Hoc
Category: 0501			**BOULDER CREEK BRIDE, BR 09845**					
0501	0240	0501-0100000A	BRIDGE REMOVAL WORK	SQFT	90.000	$50.00000	$4,500.00	Ad Hoc
			Note: this is a Hybrid LS item which bids as "LS." It carries an estimated quantity in the CostEstimate.					
0501	0250	0505-0100000J	***CONCRETE DECK MICRO-MILLING, 1 INCH DEPTH***	SQYD	260.000	$50.00000	$13,000.00	Ad Hoc
0501	0260	0505-0101000J	SELECTIVE HYDRODEMOLITION	SQYD	125.000	$150.00000	$18,750.00	Ad Hoc
0501	0270	0505-0103000J	SPECIAL REPAIR ZONE	SQYD	135.000	$150.00000	$20,250.00	Ad Hoc
0501	0280	0540-0401000J	SAW CUT TEXTURING	SQYD	230.000	$10.00000	$2,300.00	Ad Hoc
0501	0290	0584-0100000F	ELASTOMERIC CONCRETE NOSING	FOOT	87.000	$200.00000	$17,400.00	Ad Hoc
0501	0300	0842-0401000E	BRIDGE IDENTIFICATION MARKERS	EACH	2.000	$250.00000	$500.00	Ad Hoc
0501	0310	1999-9Z90000I	***CONSTRUCT HESC OVERLAY***	SQYD	260.000	$150.00000	$39,000.00	Ad Hoc
0501	0320	1999-9Z90000K	***FURNISH HESC OVERLAY***	CUYD	18.000	$2,000.00000	$36,000.00	Ad Hoc
Category: 0502			**SCOTT CREEK BRIDGE, BR 09846**					
0502	0330	0501-0100000A	BRIDGE REMOVAL WORK	SQFT	90.000	$50.00000	$4,500.00	Ad Hoc
			Note: this is a Hybrid LS item which bids as "LS." It carries an estimated quantity in the CostEstimate.					
0502	0340	0505-0100000J	***CONCRETE DECK MICRO-MILLING, 1 INCH DEPTH***	SQYD	260.000	$50.00000	$13,000.00	Ad Hoc
0502	0350	0505-0101000J	SELECTIVE HYDRODEMOLITION	SQYD	125.000	$150.00000	$18,750.00	Ad Hoc
0502	0360	0505-0103000J	SPECIAL REPAIR ZONE	SQYD	135.000	$150.00000	$20,250.00	Ad Hoc
0502	0370	0540-0401000J	SAW CUT TEXTURING	SQYD	230.000	$10.00000	$2,300.00	Ad Hoc
0502	0380	0584-0100000F	ELASTOMERIC CONCRETE NOSING	FOOT	87.000	$200.00000	$17,400.00	Ad Hoc
0502	0390	0842-0401000E	BRIDGE IDENTIFICATION MARKERS	EACH	2.000	$250.00000	$500.00	Ad Hoc
0502	0400	1999-9Z90000I	***CONSTRUCT HESC OVERLAY***	SQYD	260.000	$150.00000	$39,000.00	Ad Hoc
0502	0410	1999-9Z90000K	***FURNISH HESC OVERLAY***	CUYD	18.000	$2,000.00000	$36,000.00	Ad Hoc
Category: 0503			**LOST CREEK BRIDGE, BR 09474**					

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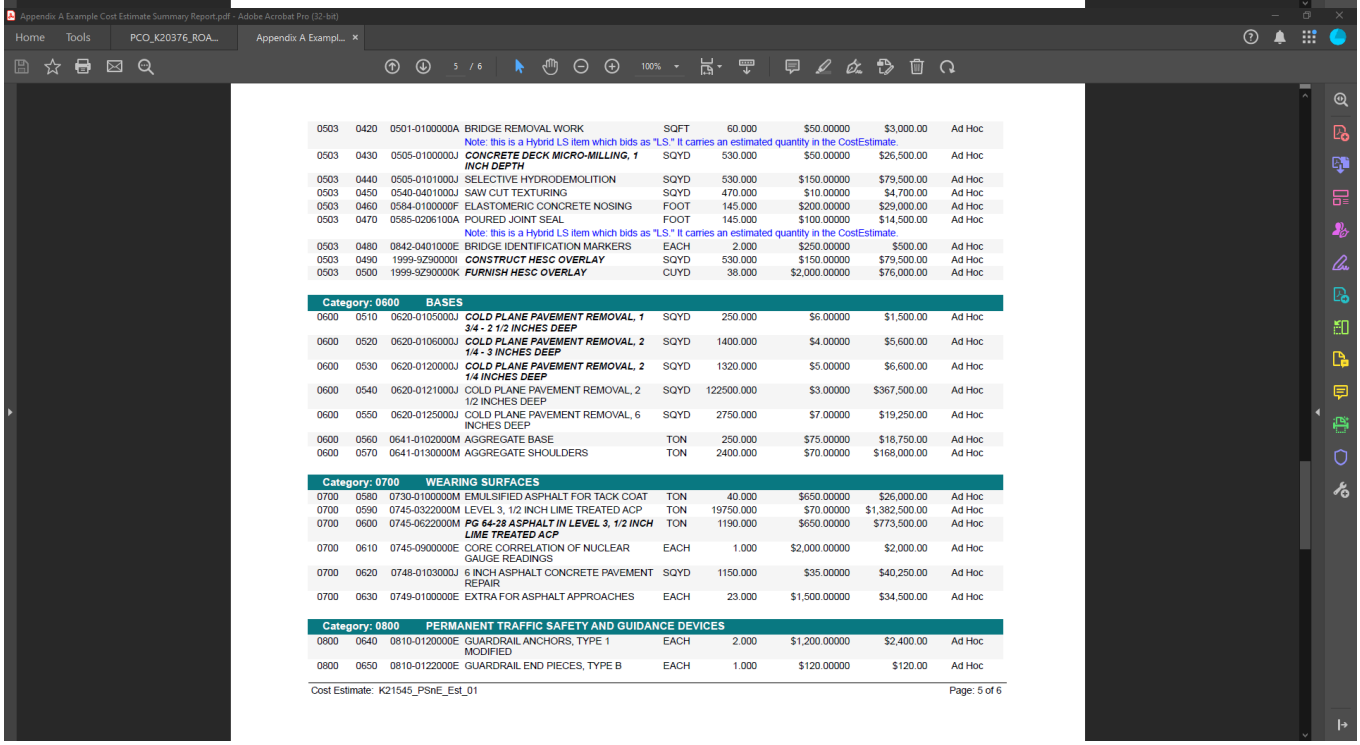

0503	0420	0501-0100000A	BRIDGE REMOVAL WORK	SQFT	60.000	$50.00000	$3,000.00	Ad Hoc
			Note: this is a Hybrid LS item which bids as "LS." It carries an estimated quantity in the CostEstimate.					
0503	0430	0505-0100000J	***CONCRETE DECK MICRO-MILLING, 1 INCH DEPTH***	SQYD	530.000	$50.00000	$26,500.00	Ad Hoc
0503	0440	0505-0101000J	SELECTIVE HYDRODEMOLITION	SQYD	530.000	$150.00000	$79,500.00	Ad Hoc
0503	0450	0540-0401000J	SAW CUT TEXTURING	SQYD	470.000	$10.00000	$4,700.00	Ad Hoc
0503	0460	0584-0100000F	ELASTOMERIC CONCRETE NOSING	FOOT	145.000	$200.00000	$29,000.00	Ad Hoc
0503	0470	0585-0206100A	POURED JOINT SEAL	FOOT	145.000	$100.00000	$14,500.00	Ad Hoc
			Note: this is a Hybrid LS item which bids as "LS." It carries an estimated quantity in the CostEstimate.					
0503	0480	0842-0401000E	BRIDGE IDENTIFICATION MARKERS	EACH	2.000	$250.00000	$500.00	Ad Hoc
0503	0490	1999-9Z90000I	***CONSTRUCT HESC OVERLAY***	SQYD	530.000	$150.00000	$79,500.00	Ad Hoc
0503	0500	1999-9Z90000K	***FURNISH HESC OVERLAY***	CUYD	38.000	$2,000.00000	$76,000.00	Ad Hoc
Category: 0600			**BASES**					
0600	0510	0620-0105000J	***COLD PLANE PAVEMENT REMOVAL, 1 3/4 - 2 1/2 INCHES DEEP***	SQYD	250.000	$6.00000	$1,500.00	Ad Hoc
0600	0520	0620-0106000J	***COLD PLANE PAVEMENT REMOVAL, 2 1/4 - 3 INCHES DEEP***	SQYD	1400.000	$4.00000	$5,600.00	Ad Hoc
0600	0530	0620-0120000J	***COLD PLANE PAVEMENT REMOVAL, 2 1/4 INCHES DEEP***	SQYD	1320.000	$5.00000	$6,600.00	Ad Hoc
0600	0540	0620-0121000J	COLD PLANE PAVEMENT REMOVAL, 2 1/2 INCHES DEEP	SQYD	122500.000	$3.00000	$367,500.00	Ad Hoc
0600	0550	0620-0125000J	COLD PLANE PAVEMENT REMOVAL, 6 INCHES DEEP	SQYD	2750.000	$7.00000	$19,250.00	Ad Hoc
0600	0560	0641-0102000M	AGGREGATE BASE	TON	250.000	$75.00000	$18,750.00	Ad Hoc
0600	0570	0641-0130000M	AGGREGATE SHOULDERS	TON	2400.000	$70.00000	$168,000.00	Ad Hoc
Category: 0700			**WEARING SURFACES**					
0700	0580	0730-0100000M	EMULSIFIED ASPHALT FOR TACK COAT	TON	40.000	$650.00000	$26,000.00	Ad Hoc
0700	0590	0745-0322000M	LEVEL 3, 1/2 INCH LIME TREATED ACP	TON	19750.000	$70.00000	$1,382,500.00	Ad Hoc
0700	0600	0745-0622000M	***PG 64-28 ASPHALT IN LEVEL 3, 1/2 INCH LIME TREATED ACP***	TON	1190.000	$650.00000	$773,500.00	Ad Hoc
0700	0610	0745-0900000E	CORE CORRELATION OF NUCLEAR GAUGE READINGS	EACH	1.000	$2,000.00000	$2,000.00	Ad Hoc
0700	0620	0748-0103000J	6 INCH ASPHALT CONCRETE PAVEMENT REPAIR	SQYD	1150.000	$35.00000	$40,250.00	Ad Hoc
0700	0630	0749-0100000E	EXTRA FOR ASPHALT APPROACHES	EACH	23.000	$1,500.00000	$34,500.00	Ad Hoc
Category: 0800			**PERMANENT TRAFFIC SAFETY AND GUIDANCE DEVICES**					
0800	0640	0810-0120000E	GUARDRAIL ANCHORS, TYPE 1 MODIFIED	EACH	2.000	$1,200.00000	$2,400.00	Ad Hoc
0800	0650	0810-0122000E	GUARDRAIL END PIECES, TYPE B	EACH	1.000	$120.00000	$120.00	Ad Hoc

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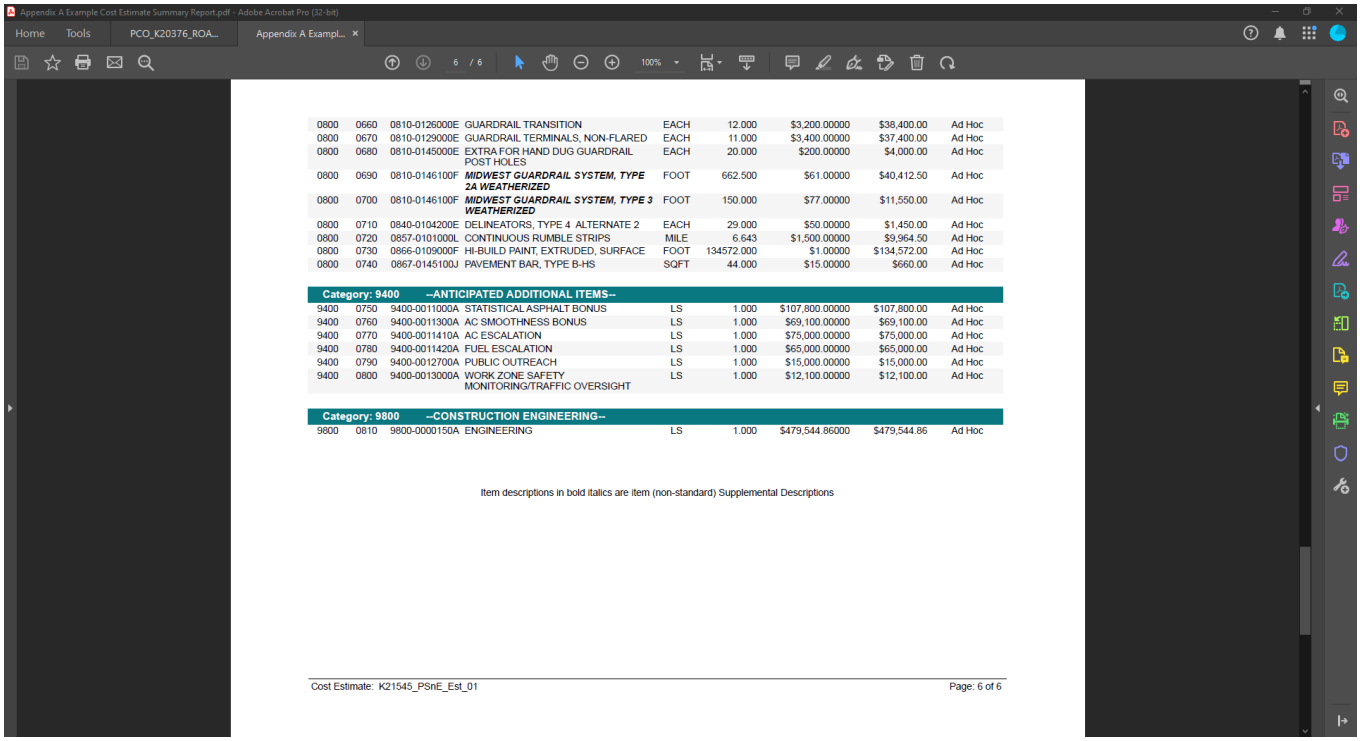


0800	0660	0810-0126000E	GUARDRAIL TRANSITION	EACH	12.000	$3,200.00000	$38,400.00	Ad Hoc
0800	0670	0810-0129000E	GUARDRAIL TERMINALS, NON-FLARED	EACH	11.000	$3,400.00000	$37,400.00	Ad Hoc
0800	0680	0810-0145000E	EXTRA FOR HAND DUG GUARDRAIL POST HOLES	EACH	20.000	$200.00000	$4,000.00	Ad Hoc
0800	0690	0810-0146100F	***MIDWEST GUARDRAIL SYSTEM, TYPE 2A WEATHERIZED***	FOOT	662.500	$61.00000	$40,412.50	Ad Hoc
0800	0700	0810-0146100F	***MIDWEST GUARDRAIL SYSTEM, TYPE 3 WEATHERIZED***	FOOT	150.000	$77.00000	$11,550.00	Ad Hoc
0800	0710	0840-0104200E	DELINEATORS, TYPE 4 ALTERNATE 2	EACH	29.000	$50.00000	$1,450.00	Ad Hoc
0800	0720	0857-0101000L	CONTINUOUS RUMBLE STRIPS	MILE	6.643	$1,500.00000	$9,964.50	Ad Hoc
0800	0730	0866-0109000F	HI-BUILD PAINT, EXTRUDED, SURFACE	FOOT	134572.000	$1.00000	$134,572.00	Ad Hoc
0800	0740	0867-0145100J	PAVEMENT BAR, TYPE B-HS	SQFT	44.000	$15.00000	$660.00	Ad Hoc
Category: 9400			**--ANTICIPATED ADDITIONAL ITEMS--**					
9400	0750	9400-0011000A	STATISTICAL ASPHALT BONUS	LS	1.000	$107,800.00000	$107,800.00	Ad Hoc
9400	0760	9400-0011300A	AC SMOOTHNESS BONUS	LS	1.000	$69,100.00000	$69,100.00	Ad Hoc
9400	0770	9400-0011410A	AC ESCALATION	LS	1.000	$75,000.00000	$75,000.00	Ad Hoc
9400	0780	9400-0011420A	FUEL ESCALATION	LS	1.000	$65,000.00000	$65,000.00	Ad Hoc
9400	0790	9400-0012700A	PUBLIC OUTREACH	LS	1.000	$15,000.00000	$15,000.00	Ad Hoc
9400	0800	9400-0013000A	WORK ZONE SAFETY MONITORING/TRAFFIC OVERSIGHT	LS	1.000	$12,100.00000	$12,100.00	Ad Hoc
Category: 9800			**--CONSTRUCTION ENGINEERING--**					
9800	0810	9800-0000150A	ENGINEERING	LS	1.000	$479,544.86000	$479,544.86	Ad Hoc

Item descriptions in bold italics are item (non-standard) Supplemental Descriptions

Cost Estimate: K21545_PSnE_Est_01 Page: 6 of 6

Figure 38: Cost Estimate Summary Report Example

Appendix B - List of Units of Measure in the Item Number

Below is a list of the single letter code at the end of the item number that designates what the unit of measure will be when the estimate item is transferred into the bid schedule prepared by PCO.

Example:	*0641-0102000**M***	*Aggregate Base*	*Ton*
	*0641-0102000**K***	*Aggregate Base*	*Cubic Yards*

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 C – Estimate QC Checklist

General Estimate Setup

☐ Estimate phase set correctly.
☐ Estimate is set to a "Merged" estimate.
☐ Unit price values are "Ad hoc" (except mobilization).
☐ Unit prices and quantities need to be to the nearest 0.01.
☐ Structure categories are set up correctly, using 0500 and 0931 categories for each structure.
☐ Structure items not associated with Part 00500 or Part 0900 (for major sign supports structures) are assigned to their structure category. (i.e. temporary work access/containment, temporary bridges, bridge markers, protective screening.)
☐ Supplemental descriptions are correct.
☐ The same pay item name is only used once unless assigned to a different category or changed by supplemental description.
☐ Only 09400 codes are used for anticipated items.

Quantities

☐ Quantities match the quantities shown in the plans and listed in the special provisions.
☐ Quantities entered correctly.
☐ Quantities updated to designers' final estimates.
☐ Quantities determined correctly based on method of measurement. (sawcutting, striping)
☐ Quantities are not rounded or inflated.
☐ Quantities are identifiable in plans.
☐ Quantities based on weights and proportions are accurate.

Unit Pricing

☐ Current market pricing for unit pricing used.
☐ Unit pricing adjusted for small quantity/low production work where fixed costs may significantly impact the unit prices.
☐ Pricing disregarded bid data that is unbalanced.
☐ Pricing considered unique or uncommon materials and specifications.

Percentage-Based Pricing

☐ Any percentage-based price appears realistic.
☐ Mobilization is 10 "percent of" the biddable items (including mobilization).
☐ TPDT is a fixed price item once specific traffic control bid items are developed.
☐ Erosion Control is a fixed price item once specific erosion control bid items are developed.
☐ Construction Survey should always be a fixed price item.
☐ Construction Engineering account for what the construction administrator needs, considering any unique inspection requirements, travel, consultant work orders, and right of way monumentation.

Lump Sum Bid Items

☐ Hybrid lump sum items match the estimated quantity listed in the .80 Measurement subsection of the special provisions or what are shown in the plans.
☐ Lump sum items shall have a breakdown of cost stored in ProjectWise.

Anticipated Items

☐ Anticipated items names and values match approved AIR and LPIFS
☐ Statistical Bonus is 5% of the final total price of the mixture (ACP + asphalt binder)
☐ ACP/PCC Smoothness Bonus used the correct pricing schedule assigned ($300 or $500 per tenth lane mile qualifying according).
☐ The MFP, MACMP, and Steel MV base prices were reviewed to determine if anticipated items for escalation are worth including.

Engineering (Construction Engineering)

☐ Engineering (aka Construction Engineering) value is vetted and finalized (entered as "ad hoc")
  ☐ Includes the amount estimated to be necessary to administer the project.
  ☐ Accounts for consultant work order contracts.

Miscellaneous Items

☐ Unique items descriptions and unit of measure match the special provisions.

Required pay items

☐ All required items are included per the ODOT Specifications Manual.
☐ All items required by other items per the specifications.

Unnecessary pay items

☐ Removed unnecessary pay items paid by other items based on the value or the scope of the work that contain provisions in the corresponding specification subsection .90.

Pay items for work not shown in plans or the scope is vague:

☐ Ensure that the bidding plans provide as much detail as possible to the scope of certain repair items and that the quantities of these items are not inflated or needed.

- Subgrade Stabilization
- Asphalt Concrete Pavement Repair
- Trench Resurfacing
- Class 2 Preparation

Consistent with current precedence:

☐ Pay items are consistent with current precedence.

Appendix D – AWP Estimation For Scoping

AWP Estimation can be used to scope projects. Please use the following guide to create scoping estimates. Note Scoping concepts were developed with the interlink between TPMS (Transportation Project Management System.) Scoping in AWP Estimation without TPMS links is discouraged. Please contact your STIP Coordinators and Scoping Coordinators to ensure the project you are scoping has all other scoping documents in TPMS.

Log In

1. From the home screen first please check you have the correct role assigned to your AWP account (Estimation- Scoping). Users that will be providing scoping estimates will need to have obtained AWP accreditation as a certified user. Please see courses here xxxxx.

Figure 39: Role Options

2. After selecting the scoping role your browser will now change to accommodate necessary items for scoping.

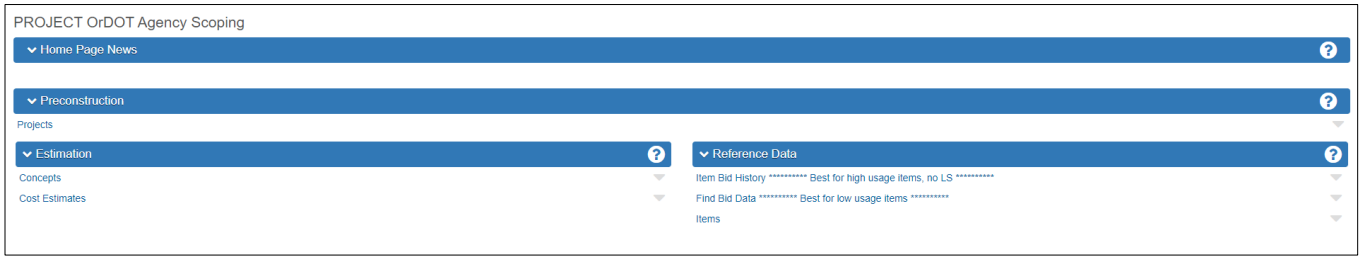


Figure 40: Scoping Page Example

Concepts: Concepts is a list of projects that are uploaded from TPMS that have been identified to be scoped for a particular STIP cycle.

3. Click on the Concepts Link.

The screen will now give you a list of scoping projects. The naming conventions are STIP YEAR (24-27) and a unique project identification number. This will coincide with your scoping folders in ProjectWise.

Concept ID	Concept Description	STIP Cycle
TEST_JW	OR30: WaNaPa at Toll House Rd	2427 - 2024-2027
2427_00398	OR30: WaNaPa at Toll House Rd	2427 - 2024-2027
2427_00397	US30: (Cascade Ave) I-84 Exit 62 - Mt Adams Ave	2427 - 2024-2027
2427_00396	I-5: Northbound OR551 - Boone Bridge (Clackamas River)	2427 - 2024-2027
2427_00395	US26 Active Traffic Management	2427 - 2024-2027
2427_00394	I-84 Active Traffic Management	2427 - 2024-2027
2427_00393	I-5 Active Traffic Management	2427 - 2024-2027
2427_00392	US30B: NE Lombard St at NE Rodney Ave	2427 - 2024-2027
2427_00391	US30B: N Lombard St at N Missiissippi Ave	2427 - 2024-2027
2427_00386	US26 at Cedar Hills Blvd	2427 - 2024-2027
2427_00385	OR99W RSA Implementation	2427 - 2024-2027
2427_00384	OR99E: SE Courtney Ave - SE Maple St	2427 - 2024-2027
2427_00382	OR8: SW Baseline St east of SW Main St	2427 - 2024-2027

Figure 41: List of Scoping Projects Example

To narrow the list of projects you may also filter the projects by the STIP Cycle and or Program and or search by the scoping number.

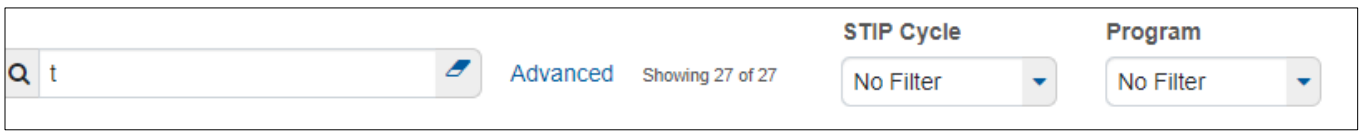


Figure 42: Project Filtering

Upon clicking on your project, you will be brought to the Concepts General Information Tab.

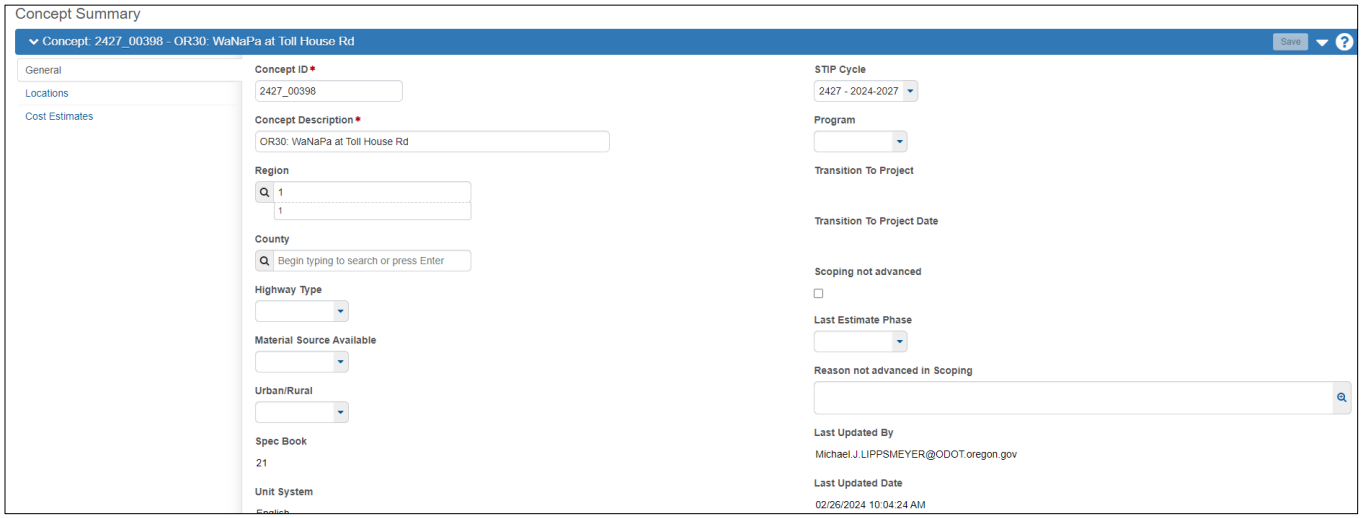


Figure 43: Concepts General Information Tab

All of the information on this tab is being loaded from TPMS. If fields are missing, please contact your Scoping Coordinator to fill in the applicable fields in TPMS which will automatically populate on the concepts general information tab.

Scoping Estimate Creation

1. From the Concepts General Information Tab please click Cost Estimates.

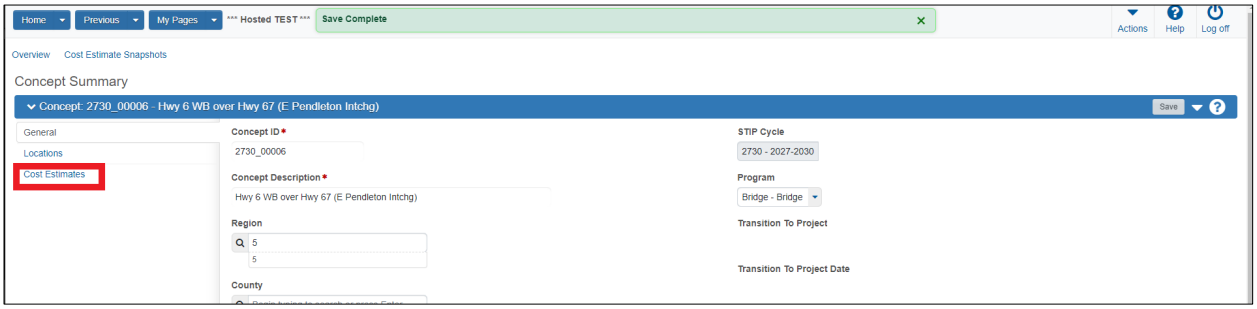


Figure 44: Location of Cost Estimates

2. Please click on the row action down arrow as shown below and click on "Select Cost Estimates."

Figure 45: Location of Select Cost Estimate Button

3. Create a new cost estimate name using the scoping number assigned to the project and select the applicable scoping template from the list provided and click add to project.

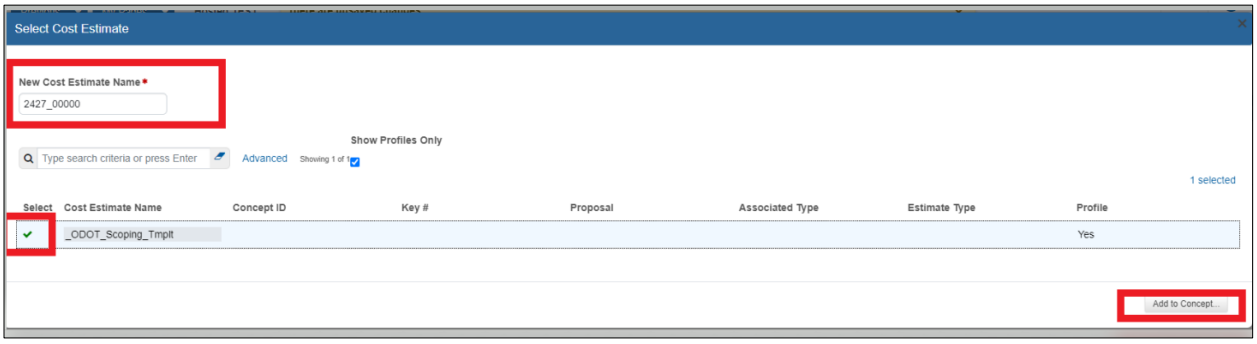


Figure 46: Example of Adding New Cost Estimate

4. Once cost estimate has been added to the project you will be immediately redirected to the following screen. Select your cost estimate name from the list. Many cost estimates can be created under the same scoping number. The most current or active estimate should always be marked by the cost estimate control check mark.

Figure 47: Cost Estimate Location

5. After opening your cost estimate update the following estimate information fields:

- Cost Estimate Description- Follow the default instructions in the field.
- Estimate Phase- Select Field or Program Scoping from the drop-down menu.
- Estimate Type- Please select "Merged" Estimate which would represent an estimate with all disciplines combined.
- Estimated BY- Search your name by entering in your email address.
- Estimate QA By- Enter the name of the QA reviewer.
- QA Review Date- Enter the date of the QA review.
- Vendor Access- Used for consultant delivered projects. Leave blank.

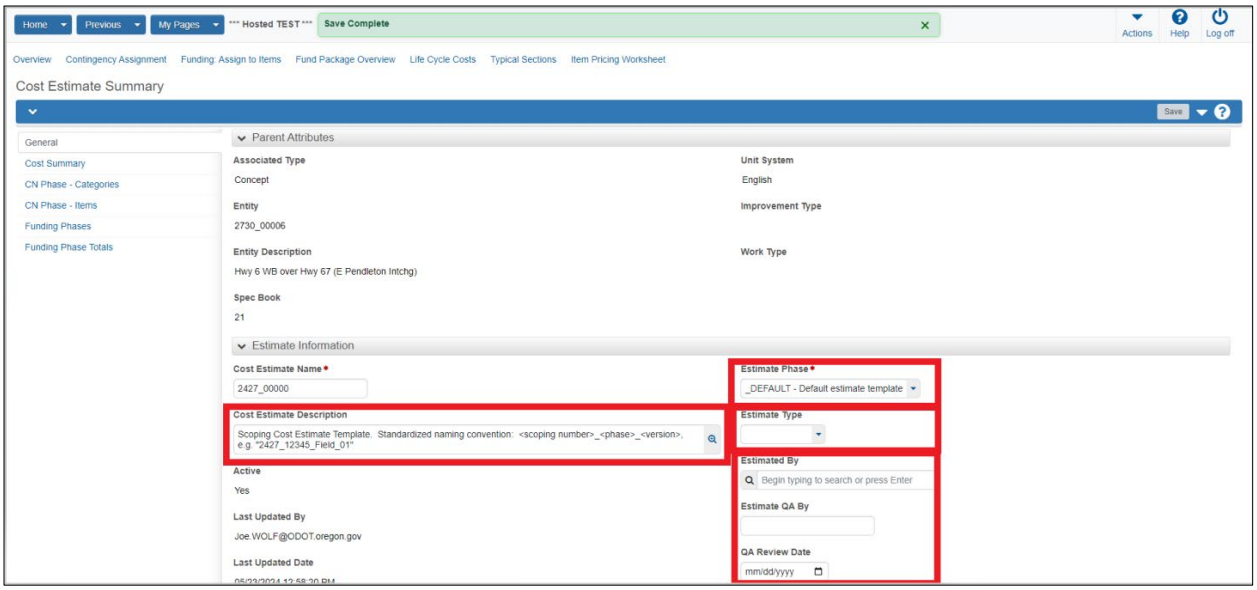
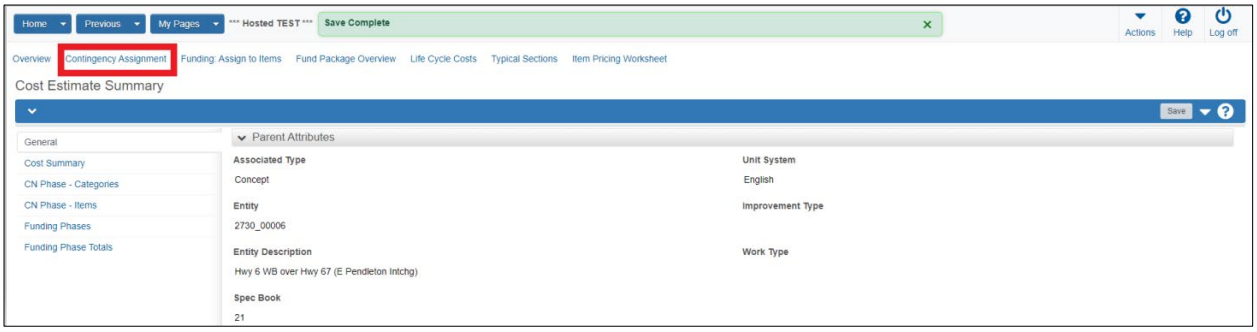


Figure 48: Location to Enter Estimate Information

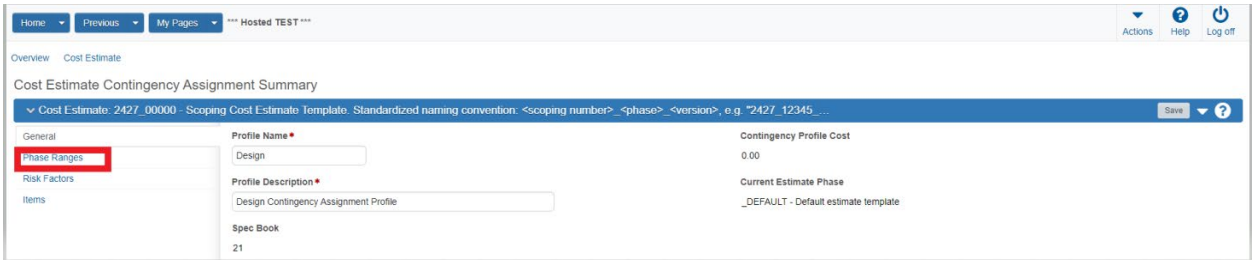
Contingency Setup

1. From the cost estimate summary page please select Contingency Assignment



Contingency Assignment is split into two categories, Construction and Design. Construction contingency is used for the amount of contingency that will carry all the way thru into construction. Design Contingency is used for design progression of unknowns and risk that is applicable to the project. The risk register will help inform the project team on the appropriate contingency for the project. There should be a minimum of 50% contingency on estimates in the scoping phase.

Select the applicable contingency category to update and select Phase Ranges



In the Program or Field scoping phase enter the applicable contingency percentage to be used. If you selected the estimate phase as Program Scoping and enter your contingency percentage into field scoping your percentage on your report will not match. Your estimate phase selected on the cost summary page will be the phased that will be used for contingency.

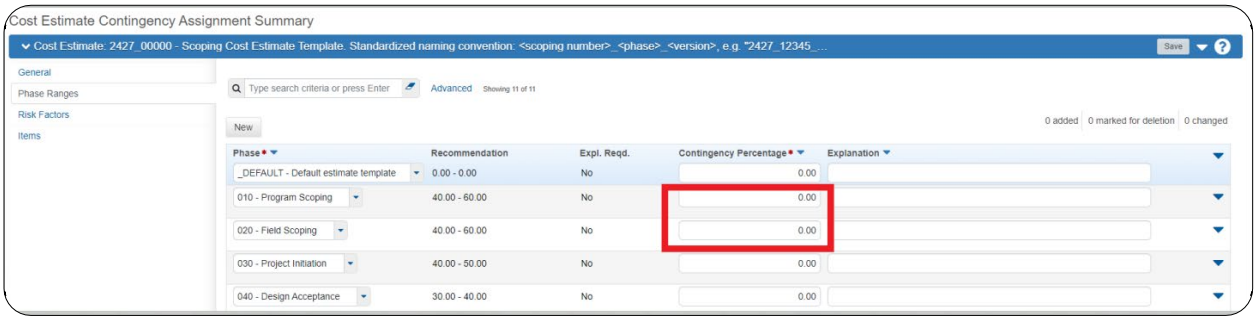


Figure 49: Location to Enter Contingency Percentage

After entering the data return to the cost estimate by selecting cost estimate at the top of the screen.

Other Phases

Estimation will be used to archive other phase cost estimates to include the following:

- PE (Preliminary Engineering)
    - Including Additional cost for the following
        - Consultant Delivery Premium
        - Value Engineering Studies
        - Cost Risk Assessment Work Shops
        - Constructability Reviews
        - (other) additive cost associated with PE
- PL (Planning)
    - Include cost associated with the planning phase. Talk with regional or statewide planners for anticipated budgets and or estimates to be entered into estimation. Save associated correspondence and or calculation sheets to ProjectWise and document all assumptions in TPMS.

- ROW (Right of Way)
    - Scoping teams shall work with their perspective right of way associates to summarize the potential right of way impacts to the project. The right of way specialist will formulate an estimate in which the value will be entered into Estimation. Save associated correspondence and or calculation sheets to ProjectWise and document all assumptions in TPMS.
- UTIL (Utility Phase)

  - Scoping teams shall work with their perspective utility associates to summarize the potential utility impacts to the project. The utility specialist will formulate an estimate in which the value will be entered into Estimation. Save associated correspondence and or calculation sheets to ProjectWise and document all assumptions in TPMS.
- OTH (OTHER PHASE)
  - Scoping teams shall identify all anticipated cost that do not fit within the PE, PL, UTIL, or CN Phases into the other phase. Examples may include ITS software procurement. Teams shall document all assumptions into TPMS and enter the associated cost value into Estimation. Place all correspondence and associated calculation sheets into ProjectWise.

Use the following steps to enter in PE, PL, ROW, UTIL, and OTH Phases.

1. From cost estimate summary home screen click Funding Phase Totals

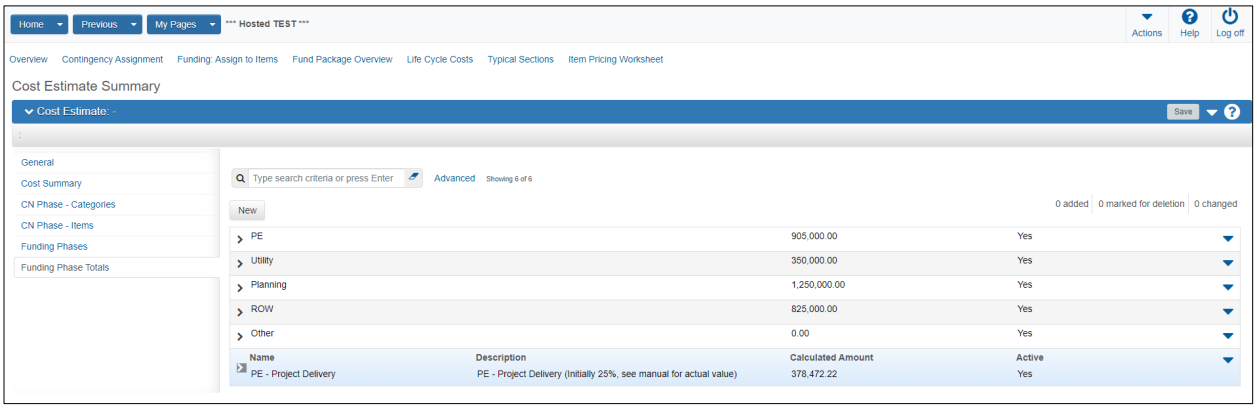


Figure 50: Funding Phase Total Page

Here you will see a breakdown of all phases not including the CN phase. There are two PE phases listed on this sheet.

2. The section titled PE- is all the associated additional cost above the standard percentages such as Value Engineering, Cost Risk Assessments, Constructability Reviews etc.
   a. To modify these values, select Funding Phases. Here you will see a list of potential items that may cause justification to increase the PE beyond the standard percentages.

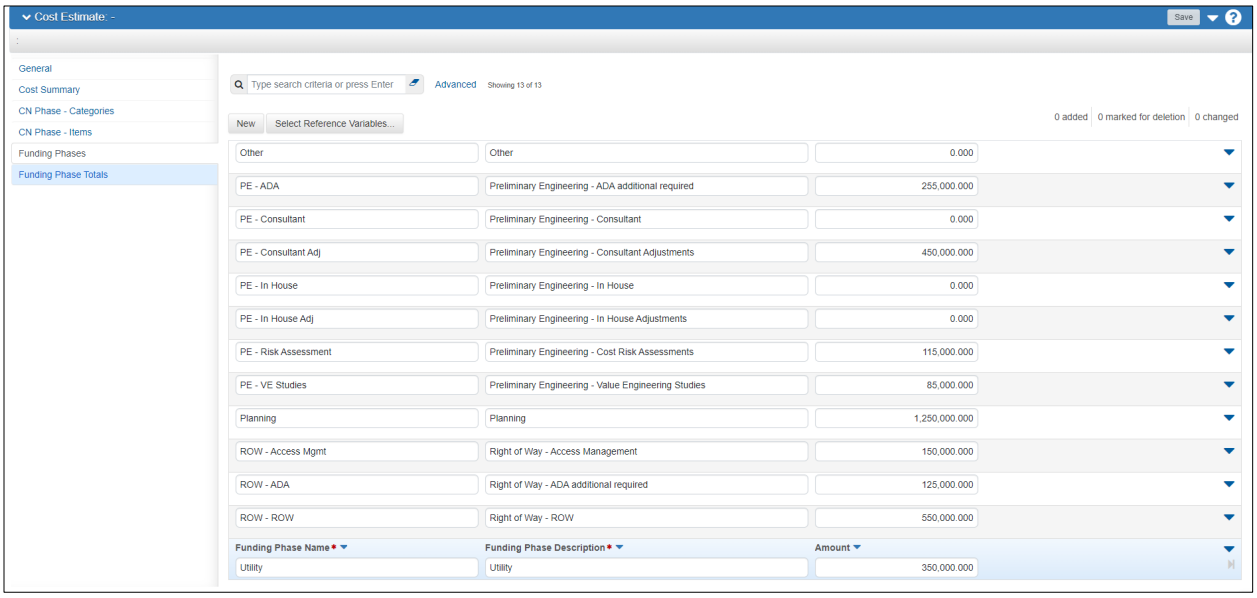


Figure 51: List of Potential Justifications

b. Enter the values associated with each item. These can be negative numbers if the team feels that they need to decrease the standard percentage as well. Upon completion of entering numbers click save. Also upload all assumptions and or calculations to ProjectWise and TPMS.

3. On the Funding Phases screen enter any associated estimated cost for Other, Planning, Right of Way, Access Management, and Utility Phases. These cost will be estimated by the regional perspective SME's and will be stored in Estimation. List all associated assumptions and calculations into TPMS and ProjectWise.

Adjust Preliminary Engineering Base Percentage

1. From the cost estimate summary screen click Funding Phase Totals

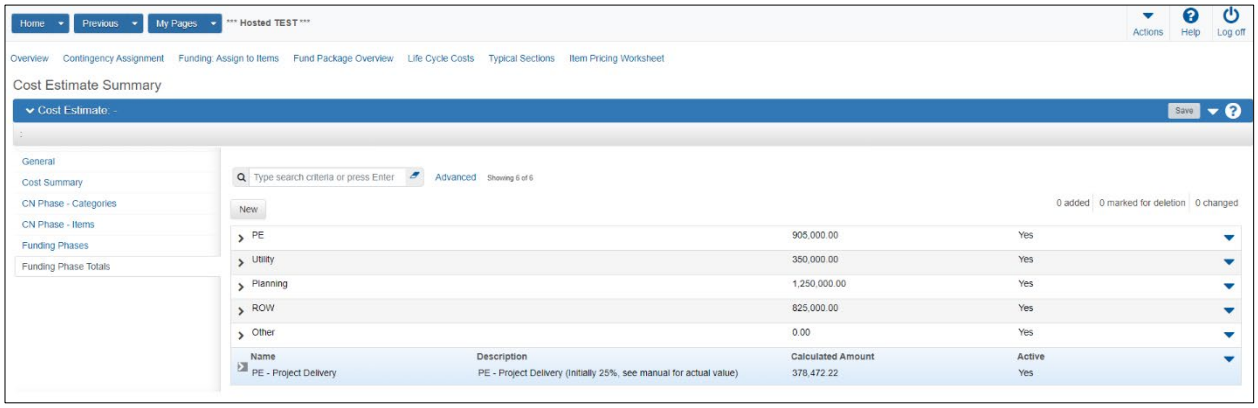


Figure 52: Funding Phase Total Page

2. Click the down arrow called PE-Project Delivery

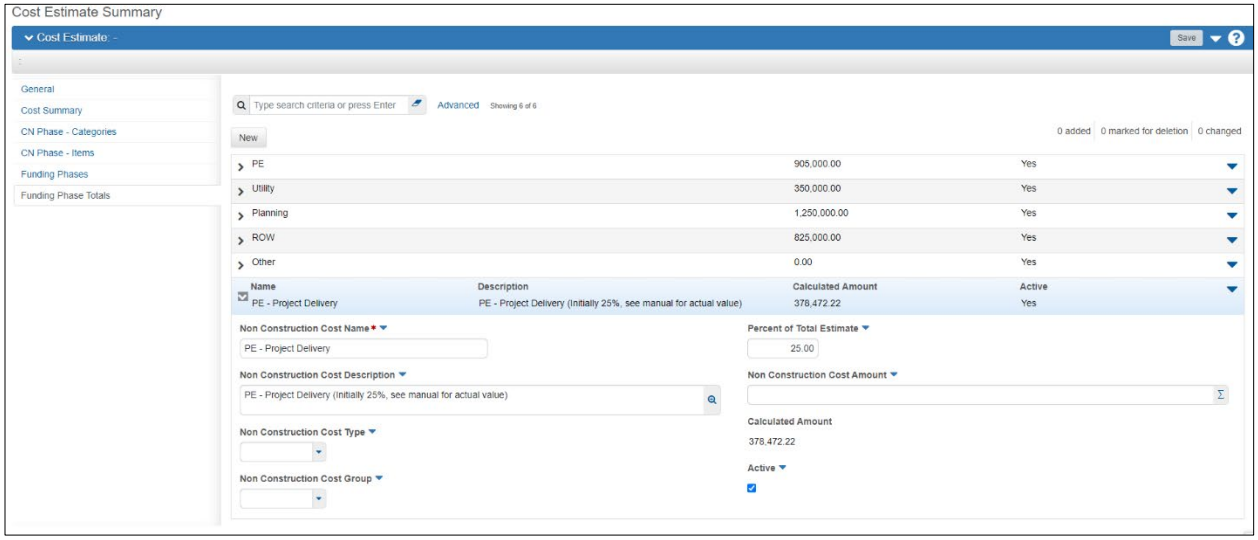


Figure 53: Example of Selecting PE- Project Delivery

a. Based on the associated tables listed in the scoping manual enter in the percentage of PE based on type and size of project listed in the tables into the Percent of Total Estimate field. Click active and save.

Inflation

Within the scoping module of TPMS project teams will fill out the following information.

ESTIMATE PHASE	MIDPOINT OF COMPLETION IN WHOLE YEARS
PLANNING	
PE (PRELIMINARY ENGINEERING)	
ROW (RIGHT OF WAY)	
UTILITY	
OTHER	
CONSTRUCTION	

This information will be used to calculate the annualized inflation for each funding phase of the project to the midpoint of that phase. Inflation numbers will be provided by the financial services department. These rates can be found here.

Inflation rates will be fixed during scoping and will be adjusted to current projections prior to final adoption of the STIP.

CN-Phase Estimate

1. To estimate the biddable work for your scoping project, click on Item Pricing Worksheet

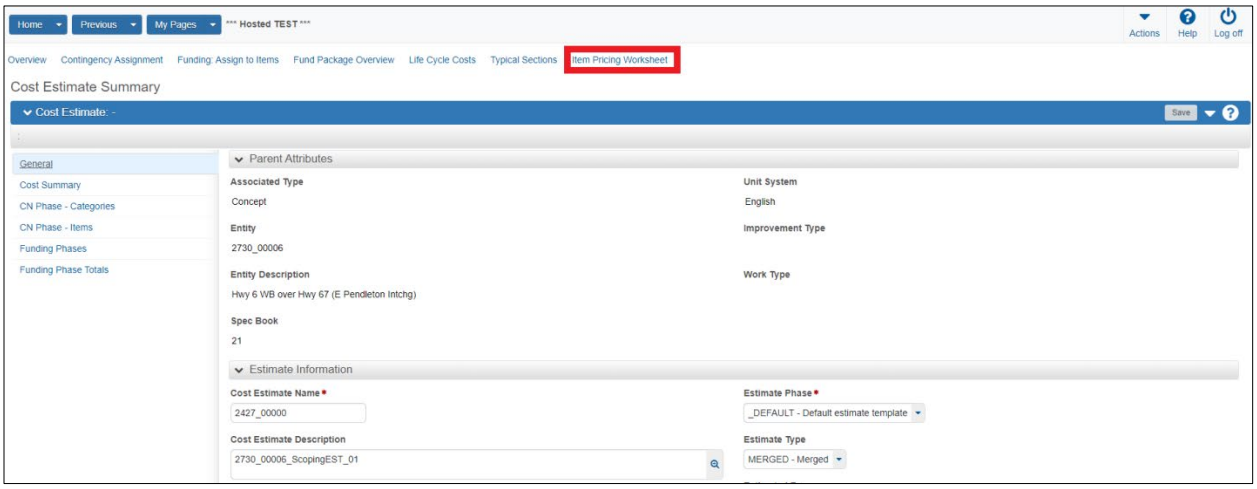


Figure 54: Item Pricing Worksheet Location

2. Follow the instruction listed in the Add Project Items section to add bid items.

Scoping Cost Summary Reports

Use the following steps to create a Cost Summary Report in a PDF format that will show to total cost of the project.

1. Click the row action arrow next to the save button and select the Cost Estimate Summary Report. Once prompted click on Execute leaving the default parameters unchanged.

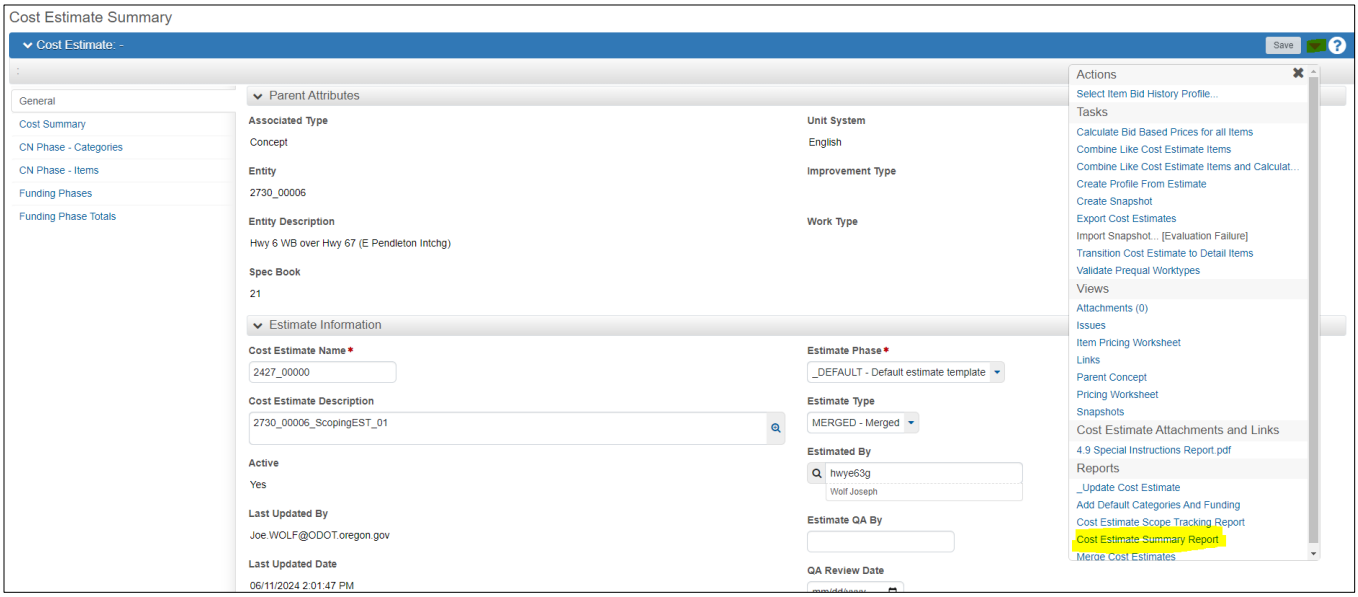


Figure 55: Location of Cost Estimate Summary Report

Oregon Department of Transportation

Cost Estimate Summary Report

Cost Estimate Name: 2427_00000
Description: 2730_00006_ScopingEST_01
Date Items Last Updated: 06/11/2024
Estimated By: Joseph Wolf
Estimate Phase: Default estimate template
Estimate Type: Merged

Phase Summary (adjusted for inflation)

Phase	Phase Year (midpoint)	Inflation Factor	Current Amount	Inflation Amount	Amount Adjusted for Inflation
Planning (PL)	2025	1.250	$1,336,354.26	$334,088.57	$1,670,442.83
Prelinary Engineering (PE)	2026	1.250	$350,000.00	$87,500.00	$437,500.00
Right of Way (RW)	2025	1.250	$1,250,000.00	$312,500.00	$1,562,500.00
Utility Relocation (UR)	2026	1.250	$825,000.00	$206,250.00	$1,031,250.00
Construction (CN)	2029	1.250	$1,778,403.13	$444,600.78	$2,223,003.91
Other (OT)	2028	1.250	$0.00	$0.00	$0.00
				All Phases Future Value Total	$6,924,696.74

Phase Breakdowns

Name	Description			Cost
PE - Project Delivery	PE %	25	*Formula: PE % * (Bid items + AIs + CE)*	$431,354.26
Planning	Planning			$1,250,000.00
PE - ADA	Preliminary Engineering - ADA additional required			$255,000.00
PE - Consultant	Preliminary Engineering - Consultant			$0.00
PE - Consultant Adj	Preliminary Engineering - Consultant Adjustments			$450,000.00
PE - Risk Assessment	Preliminary Engineering - Cost Risk Assessments			$115,000.00
PE - In House	Preliminary Engineering - In House			$0.00
PE - In House Adj	Preliminary Engineering - In House Adjustments			$0.00
PE - VE Studies	Preliminary Engineering - Value Engineering Studies			$85,000.00
ROW - Access Mgmt	Right of Way - Access Management			$150,000.00
ROW - ADA	Right of Way - ADA additional required			$125,000.00
ROW - ROW	Right of Way - ROW			$550,000.00
Utility	Utility			$350,000.00
Other	Other			$0.00

Cost Estimate: 2427_00000 Page: 1 of 4

Figure 56: Cost Estimate Summary Report Example

The Cost Estimate Summary Report PDF breaks down each funding phase, its phase year (mid point), the inflation factor, which is provided by ODOT Economics, the total amount and the additional inflation dollars to get the total estimate cost at year of expenditure.

Total project cost should equal the All Phases Future Value Total.

Phase breakdowns provides a breakdown of each phase. The remainder of the report provides detailed CN estimate data in current year dollars.