



## FDM 19-5-1 General

December 5, 2017

This section is intended to provide guidance for the user on process and procedures for preparing, documenting, and checking an estimate, developing a proposal, and submitting it for PS&E.

For mega project estimating, refer to the [Mega Project Guidelines Webpage](#).

## FDM 19-5-3 Bid Item Guidance

May 15, 2025

This procedure establishes guidelines for the proper use of bid items. The goal is to obtain uniformity in bidding practices and to use the right bid item correctly for a given situation.

See the [standardized special provisions \(STSP\) page](#) for guidance and recent changes to the STSPs.

### 3.1 Updated/Newer Bid Items

The following guidance highlights new or changed standard specifications bid items. The items highlighted below do not include all new items. The changes are effective with the August 2025 PS&E submittal.

**Landmark Reference Monuments:** Standard spec. 621 is being removed. Information from 621 is being updated and incorporated into new specs 680 & 682.

**Public Land Survey Monument Verify and Reset, Item 680.0100:** Include this item for each US Public Land Survey System (USPLSS) monument within the project limits. Refer to [FDM 9-5-1.6](#) for further guidance.

**Salvage Geodetic Survey Disc, Item 682.0100:** Include this bid item when an existing geodetic survey monument will be removed as determined by the WisDOT Geodetic Surveys Unit (GSU). Refer to [FDM 9-5-1.5](#) for further guidance.

**Geodetic Survey Monument, Item 682.0200:** Include this bid item when a geodetic survey monument will be constructed as determined by the WisDOT Geodetic Surveys Unit (GSU). Refer to [FDM 9-5-1.5](#) for further guidance.

### 3.2 Usage Guidance for Other Items

**Excavation and/or Backfill:** Excavation and backfill beyond what is normally required to accommodate the structure, formwork, and construction operations is excess excavation and backfill. Minor amounts of excess excavation and backfill can be treated as incidental to the Excavation for Structures bid items. Significant amounts of excess excavation and backfill should be paid for separately under other contract excavation and backfill bid items. Add excavation and backfill bid items to contracts that do not already have the appropriate bid items to cover excess excavation and backfill. Determine the quantities for excess excavation and backfill and include those quantities in the amount shown on the miscellaneous quantities sheet for the affected bid items.

**Removing Concrete Pavement, Item 204.0100:** If the removal is to an existing joint or if sawing is required it should be noted on the plans. Concrete pavement removed in conjunction with Roadway and Drainage Excavation will be measured and paid for as Removing Concrete Pavement.

**Removing Concrete Pavement Butt Joints, Item 204.0105 and Removing Asphaltic Surface Butt Joints, Item 204.0115:** Removing Pavement Butt Joints is to be used on concrete pavement. Removing Asphaltic Surface Butt Joints is to be used on asphalt pavement. Always include a construction detail with these items indicating the pay limits of removal. Sawing is included if contractor methods necessitate it to meet the standard specification.

**Excavation Rock, Item 205.0200:** When rock is apparent within project limits but is not anticipated to be encountered within the excavation limits, do not include it as a bid item. The boring or sounding information should be shown on the plan but do not show extrapolated rock profiles or cross sections. When the designer is aware of the presence of rock which is apparently outside the excavation limits, there are several alternatives

available:

- Perform adequate soundings to verify the rock limits, so an accurate determination can be made whether rock excavation is or is not going to be required.
- Perform adequate soundings as above, then adjust the gradeline to avoid rock excavation entirely.
- When, in the judgment of the designer, the available information is deemed adequate to determine that rock excavation will not be required, place a statement in the plan General Notes that indicates there is reason to believe rock is present within the project limits, but outside the proposed excavation limits, and this information is contained in the district project files.

When rock excavation is known to be required, it shall be included as a contract bid item. Keep in mind that shallow rock cuts or small quantities cost more on a unit basis than deeper cuts, or larger quantities. When such is the case, as when rock is encountered in a ditch line only, the designer must determine whether the ditch can be altered to avoid rock cut, or if the ditch is even necessary.

**Prepare Foundation for Asphaltic Paving (EACH), Item 211.0101:** This item shall be included in contracts meeting one of the following criteria:

- Asphalt pavement is being constructed over existing concrete pavement, over existing asphaltic pavement, or over existing base course shoulders. NOTE: When existing base course shoulders are to be included under this item, clarify this for the bidders by either showing the transverse width of the preparation item via a dimension line going to the outside edge of the base course shoulders on the Typical Finished Sections or by noting this in a special provision article.
- Asphaltic pavement is being constructed under a separate contract from the base layers.
- Through traffic will be using the completed base layers
- Existing asphaltic surface is salvaged full depth and there is no base aggregate item in the contract.
- Existing asphaltic surface is salvaged or removed by milling and carries traffic on milled surface.

A Miscellaneous Quantity listing should be included in the plan to clarify to all bidders the Sta. – Sta. limits, or locations where this item applies.

**Prepare Foundation for Asphaltic Shoulders (Stations - per side of the roadway), Item 211.0400:** Include this item in contracts where an asphaltic shoulder is being constructed or widened adjacent to an existing asphalt or concrete pavement and requires the excavation of the existing crushed aggregate shoulder prior to placement of the asphaltic shoulder. This item also includes the reconstruction of the base shoulder using the excavated base course material, after the new asphalt shoulder is paved. NOTE: Excess shoulder base course material that can't be bladed to a nearby shortage area along the roadway can be trucked to a shortage area by use of item 305.0504.S, "Hauling Excess Shoulder Material" by the CY.

**Shaping Shoulders (Stations - per side of the roadway), Item 305.0500:** Include this item in contracts where it is necessary to blade the existing crushed aggregate shoulder away from the existing pavement and then reshape the shoulders to the desired cross section. NOTE: Excess shoulder base course material that can't be bladed to a nearby shortage area along the roadway can be trucked to a shortage area by use of item 305.0504.S, "Hauling Excess Shoulder Material" by the CY. Shaping Shoulders bid item is not needed to maintain drainage for milling, or pulverizing operations as standard specification for those items address maintaining drainage. Generally, Shaping Shoulders is not needed on projects where new base aggregate is being placed on existing shoulders.

**Shaping Roadway (Stations – per centerline of the roadway), Item 305.0502.S:** This item is to be used where all the existing pavement is to be salvaged or removed and the remaining base course shoulders are to be graded and shaped across the whole roadway to prepare a foundation template for new asphalt pavement.

**Base Aggregate Dense, Breaker Run, Select Crushed Material, Pit Run and Backfill Granular Conversions, Items 305.0110, 305.0120, 305.0130, 310.0110, 311.0110, 312.0110, 313.0110, 209.0100 and 210.0100:** To gain additional consistency in estimates, the following statewide conversion factors are provided for granular materials. Designers are to use values within the conversion factor ranges of Table 3.1 The

conversions are based on Region experience and are for compacted material.

**Table 3.1 Compacted Aggregate Conversion Factors**

| Bid Item Number | Material Bid Item Name            | Conversion Factor (Tons/Cubic Yard) |
|-----------------|-----------------------------------|-------------------------------------|
| 305.0110        | Base Aggregate Dense 3/4-Inch     | 1.75 - 2.1                          |
| 305.0120        | Base Aggregate Dense 1 1/4-Inch   | 1.75 - 2.0                          |
| 305.0130        | Base Aggregate Dense 3-Inch       | 1.75 - 2.2                          |
| 310.0110        | Base Aggregate Open Graded        | 1.6 - 1.9                           |
| 311.0110        | Breaker Run                       | 1.7 - 1.8                           |
| 312.0110        | Select Crushed Material           | 1.7 - 1.9                           |
| 313.0110        | Pit Run                           | 1.6 - 1.8                           |
| 209.0100        | Backfill Granular (Grade 1 or 2)  | 1.5 - 1.7                           |
| 210.0100        | Backfill Structure (Grade A or B) | 1.75 - 2.0                          |

**Base Patching, Items 390.0101 - 390.0405:** The Base Patching items are for patching existing concrete pavement that will be overlaid with new pavement. Payment is for providing and placing concrete or asphalt for the patch. Removal and sawing of the existing pavement are paid separately under 390.0100 Removing Pavement for Base Patching and 690.0250 Sawing Concrete.

**Coloring Concrete:** When specifying the standard WisDOT red colored concrete use item 405.0100 Coloring Concrete WisDOT Red. Other colors will require using item 405.0200 Coloring Concrete Custom and STSP 405-020 to specify the color and pigment load. The region will need to have comparison samples for each color available to the contractor for viewing at the region office.

**Concrete Pavement Gaps, Item 415.0210:** The use of paving gaps should be minimized; however, if the designer determines they are necessary they shall be shown on the plan and profile sheets and listed in the miscellaneous quantities. If the staging requires multiple gaps at one roadway location include a quantity for each gap.

**Concrete Truck Apron 12-inch, Item 415.2010:** Use this bid item for the concrete truck aprons. Include bid item 405.0100 - Coloring Concrete Red when specifying roundabout truck aprons.

**Concrete Rumble Strips Transverse, Item 465.0580:** Use this bid item on projects requiring concrete rumble strips on approaches to intersections. For rumble strips inlaid into existing HMA or concrete pavement include a Concrete Pavement Replacement or Concrete Pavement Replacement SHES bid item.

**Hot Mix Asphalt (HMA) Cold Weather Paving, Item 450.4000:** The intent of the Department is not to pave asphaltic material during cold weather. The proposed construction schedule outlined in the design contract time for completion (refer to [FDM 19-10-30](#)) should not indicate asphalt paving within the locations and during the timeframes outlined below.

However, due to project or community needs, changes in construction schedule, emergencies, and weather variability there will be situations where the Department allows the contractor to pave during cold weather.

Include the HMA Cold Weather bid item when the contractor will likely place asphaltic pavements under [standard spec 460](#), [standard spec 465](#) and related special provision items when the ambient temperature is less than 40 degrees Fahrenheit. To estimate when cold weather paving may occur use the following locations and timeframes. Refer to [FDM 14-10 Attachment 10.5](#) for asphalt zones.

- in the WisDOT Northern Asphalt Zone from September 15 through June 1, or
- in the WisDOT Southern Asphalt Zone from October 1 through May 15.

Unless the designer can determine the quantity more accurately, estimate 25 percent of the asphaltic pavements placed within the above-mentioned timeframes or less than 40 degrees Fahrenheit under the HMA Cold Weather Paving bid item.

For example, a project located in the Southern Asphalt Zone anticipates that they will be placing a total of 30,000 tons of HMA Pavement Type MT. The design contract time for completion indicates that 10,000 tons will be placed after October 1st. The designer would estimate 2,500 tons (10,000 tons x 25%) as the HMA Cold Weather Paving.

In extreme cases, STSP 450-010 should be used on a project-by-project basis and approved by FHWA. It must be included for those projects that have paving occur within the following:

- in the WisDOT Northern Asphalt Zone from November 1 through April 15, or
- in the WisDOT Southern Asphalt Zone from November 15 through April 1

This can happen by design, during construction as an excusable compensable delay, or by request of the contractor. Paving station limits must be identified. The STSP is only to be used for traffic control, temporary pavements or in emergency situations. Permanent pavement is not to be construed under this STSP.

In addition, designers should consider carrying over portions of the asphalt paving to the following season. Particularly if a project schedule requires a significant amount of late season, or cold weather paving. Designer can use a special provision (SPV) to pave the final layer of asphalt the following construction season.

Several factors play into whether a project should consider paving the final layer the following year, including:

- Existing pavement structure: Would the lower layers of asphalt placed this season be sufficient to support traffic over the winter season? Designers need to consult with the region pavement engineer.
- Soil conditions: Are there poor soils, and therefore an increased risk of sections of pavement needing repair the following year before paving the surface layer?
- Maintenance and cost responsibility: Consider work zone traffic control, detours, temporary and permanent signage, drainage, erosion control, business and pedestrian accommodations, etc. Who will maintain and repair these items over the winter season and who will pay to repair and replace? For example, if there are inlets, manholes or other structures that will require ramping, who would maintain these temporary items and who would pay to repair or replace?
- Business and local resident impacts: Are there reasons that carrying over would cause undue burden to the businesses or local residents? Do these business and local impacts override constructing a better-quality surface the following paving season?
- Project schedule impacts: Are there reasons that carry over of this project would cause problems with the staging of other projects? Does the need to complete this project due to another project staging override a better-quality surface the following paving season?

There may be additional considerations, but these are some items to think about when considering using an SPV to carry over the construction project to the following construction season.

**HMA Pavement Percent Within Limits (PWL):** For guidance on the use of the PWL specs, refer to [FDM 19-21-5.2.4](#) and consult with the region Pavement Engineer.

**Asphaltic Surface Patching, Item 465.0110:** A quantity of Asphaltic Surface Patching should be included on all asphaltic pavement resurfacing contracts that are open to traffic. This will provide the contractor with a means to make minor repairs (i.e - filling potholes or pop outs that occur under traffic handling and for ramping as directed by the engineer at saw cut match-in joints prior to the asphaltic pavement overlay being constructed). Also, provide a "Remarks" column on the MQ table and explain the intended purpose of each undistributed estimated quantity shown.

**Ice Hot Weather Concreting (for Hot Weather Paving Concrete Structures), Item 501.1000.S:** As outlined in [Standard Spec 501.3.8.2](#), the contractor is responsible for the quality of concrete placed in hot weather. The contractor must utilize ice or other means to control the concrete temperature in hot weather. Use the following design guidance to determine when and estimate how much ice to include when project includes pouring concrete structures during hot weather.

Include Ice Hot Weather Concreting, Bid Item 501.1000.S in the structure plan when:

1. The structure contract utilizes any quantity of High-Performance Concrete (HPC) masonry structures or,
2. The combined contract quantity of the items listed in [Standard Spec 501.3.8.2.1\(2\)](#) is 2,000 CY or more, and
3. The placement of the above-mentioned items is between June 15th and August 15th.

Use the following equation to estimate the quantity of ice for hot weather concreting structures:

$$\text{Ice (lbs)} = (15\%) \times (\text{Concrete Quantity CY}) \times (50 \text{ lbs/CY})$$

**Curb and Gutter:** When curb and gutter is built under a separate contract from the grading work, the designer shall specify who is responsible for backfilling the two feet behind the curb and gutter.

**Reconstructing Catch Basins, Manholes or Inlets; Adjusting Catch Basin, Manhole, or Inlet Covers; Salvaged Manhole or Inlet Covers:**

- Use the bid items Reconstructing Catch Basins, Reconstructing Manholes, or Reconstructing Inlets for any situation requiring an existing drainage structure to be, reconstructed, adjusted more than twelve inches, or if the adjustment requires removal beyond adjusting rings or shims.
- Use the bid items Adjusting Catch Basin Covers, Adjusting Manhole Covers, or Adjusting Inlet Covers when the existing frame and cover will be reused on the existing drainage structure and an adjustment of twelve inches or less is required. (If a new cover is supplied, adjustment is included in the cost of the new cover)
- Use the bid items Salvaged Manhole Covers or Salvaged Inlet Covers when the existing cover is to be removed, stored elsewhere on site, then later reinstalled. (If adjustment is required when reinstalling, the cost for adjustment is included in salvaging)

**Barrier System Grading and Shaping Finishing, Item 614.0010:** Use this item when there is no other grading, shaping and finishing work in the area of the barrier system. For work within the grading limits, or if there is other spot grading and finishing in the project the work should be paid for under other contract items (excavation, borrow, topsoil, seed, emat, etc.).

**Maintenance and Repair of Haul Roads, 618.0100:** This is required on all projects on the State Trunk Highway System, except projects within city limits where the existing truck traffic makes it too difficult to determine pavement damage by haul road trucks, and where the city already has a roadway maintenance program. The item may be used on Local Program projects if the item is 100% locally funded.

**Mobilization, 619.1000:** This is required on all contracts. Contracts with multiple projects shall have one bid item prorated between projects.

**Culvert Pipe Checks, 628.7555:** This item is measured and paid by the individual bag used, not by specific location.

**Signs Type I (reflectivity), Item 637.1000-1999, Signs Type II, Items 637.2000-2999, and Signs Type III, Items 637.3000-3999:** Refer to the [Sign Code and Sign Plate manuals](#) to determine the type of reflective sheeting for sign.

**Traffic Control Covering Signs Type I, Item 643.0910 and Type II, Item 643.0920:** Use these items to cover conflicting permanent type I and type II signs during construction. Indicate in the miscellaneous quantities which signs are to be covered and include a quantity for each time the sign will be covered and uncovered throughout the project. Refer to [FDM 11-50-21.1.1](#) for further guidance.

**Traffic Control, 643.5000:** Include this item in all projects with any traffic control work. In contracts with multiple projects, prorate the quantity so the contract total equals one (1).

**Cold Weather Marking Epoxy, 6-Inch Item 646.6466. and 10-Inch Item 646.6460:** Include bid item for late season marking on all projects projected to be completed when the ambient or pavement temperature is less than 50°F typically after October 1.

**Construction Staking:** Consider the time a contractor will need to perform initial staking. Ensure that there is adequate time available after contract execution to complete the initial staking and subsequent contract work within the prescribed contract time. Give large grading projects and projects let late in the year careful consideration. To estimate the contract execution date, assume the contract will be executed approximately 6 weeks after the let date.

If a project's letting date is delayed and the contract includes initial staking, reevaluate whether the contractor will have ample time to complete initial staking and subsequent contract work within the prescribed contract time.

If determined that the contractor will likely be unable to complete the supplemental project survey control, slope staking and subsequent contract work within the prescribed contract time, consider utilizing the survey services of one of the following:

- State or consultant forces.
- Consultants administering or providing support on the project.

- Consultant under surveying master contract.

|  |  |
|--|--|
| Construction Staking, Storm Sewer System, Item 650.4000          | Include in projects where storm Sewer is being placed and contractor staking is used   |
| Construction Staking, Subgrade, Item 650.4500                    | Include on grading projects. Item may be added for a dense base contract where the grading was done in previous contract and needs to be rechecked before placing dense base.  |
| Construction Staking, Base, Item 650.5000                        | Include on base aggregate and asphalt projects. Do not include this item when concrete pavement is being constructed in same contract. Concrete pavement staking covers staking dense base and open-graded base.   |
| Construction Staking, Curb, Gutter, Curb & Gutter, Item 650.5500 | This item is for asphalt roadways. Use this item if there is 50 L.F. (15 m) or more of curb and gutter required. Do not include this item with concrete roadways. Do not use this item for staking curb and gutter in rural intersections on resurfacing projects.   |
| Construction Staking, Pipe Culvert, Item 650.6000                | Include on projects for staking culvert pipe cross drains. Do not include item for field or private entrance pipes.  |
| Construction Staking, Structure Layout, Item 650.6501            | Include in projects for stakeout of bridge like structures, box culverts, retaining walls, and noise barrier walls.  |
| Construction Staking, Concrete Pavement, Item 650.7000           | Include on concrete paving projects. This item includes staking of dense and open graded base course Construction Staking, Subgrade is not included in this item and should be included as a separate item in the contract if grading is completed within the contract prior to placing concrete pavement. |
| Construction Staking, Concrete Barrier, Item 650.7500            | Include in projects where large quantity is involved. Do not include this item if concrete barrier abuts concrete pavement.  |
| Construction Staking, Resurfacing Reference, Item 650.8000       | Include in resurfacing or pulverizing projects   |
| Construction Staking, Electrical Installations, Item 650.8501    | Include in all projects where large quantity is involved. Consider not using where numerous installations need field adjustment or plan does not have layout information available.  |
| Construction Staking, Curb Ramps, Item 650.9000                  | Include in all projects where individual curb ramps have location-specific layout information that includes elevations in the plan details. Standard Detail Drawings (SDD) are not considered layout information. Do not use pay item on any individual curb ramp that does not have layout information.   |
| Construction Staking, Sidewalk, Item 650.9500                    | Include on all projects whenever the contract contains a sidewalk bid item.  |
| Construction Staking, Supplemental Control, Item 650.9911        | Include in all projects where contractor staking is used.  |
| Construction Staking, Slope Stakes, Item 650.9920                | Include on all grading projects when the department is not performing slope staking.   |

NOTE: When two or more roadways occur, construction staking subgrade, crushed aggregate base course, concrete pavement, resurfacing reference, and slope stakes will be measured by the linear foot along the centerline or reference line of each roadway.

**Temporary Diversion Channels:** To construct concrete box culverts, structural plate pipes or structural plate pipe arches, it is sometimes necessary to construct temporary diversion channels to maintain drainage. If a temporary diversion channel is required, bid items for all work to be performed for the construction and removal of the channel shall be included in the contract.

If the channel is optional, work will be considered incidental to the bid item of Excavation for Structures. Only the bid items for erosion control shall be paid for separately.



### 3.3 Quantities

Accurately estimating quantities can influence contractor bidding and construction administration and is important to minimizing contract over/under runs. Ensure someone has reviewed miscellaneous the project quantities. A good estimate cannot be accurate with errors in the quantities. The quantity reference table ([Attachment 3.1](#)) list references for calculating items.

Information on the goals and reporting of the quantities performance measure can be found on the DTSD performance management page under the Project development functional area.

Follow region procedures for entering quantities into FIIPS. DOT Staff can refer to the project management manual (PMM) 05-10-15. [Attachment 3.2](#) or a similar form can be used to report quantities to the region.

#### 3.3.1 Undistributed Quantities

Use of undistributed quantities should be minimized in all contracts. Bid item quantities which can be calculated based on the design such as pavements, storm sewer, curb and gutter, etc. shall not include undistributed quantities. The existing project site could potentially impact the quantities estimated for the project. Section 104.2.2.4.3 Changed Quantities was added to the Standard Special Provisions to address potential variations between the estimate quantities and the measured quantities. If estimated quantities exceed established parameters outlined in Section 104.2.2.4.3 WisDOT or the Contractor may request a cost adjustment.

There are a limited number of bid items for which irregularities in the existing topography can impact the ability to provide an accurate estimated quantity. In these situations, designers may provide an undistributed quantity to correctly quantify the anticipated quantity of work.

Examples of these items are:

- topsoil
- seeding
- sodding
- erosion mat
- erosion bales
- mulching
- silt fence

Some contract items may involve multiple methods of construction. The cost to perform the different methods of construction may vary. The unit costs for these types of items are typically referred to as blended prices. If it is necessary to add undistributed quantities to a bid item with a blended price evaluate the item carefully to ensure work in areas with higher construction costs are identified.

#### 3.3.2 Rounding Quantities

Round quantities to the number of decimal places justified by the data. Quantity table totals must match the Estimate of Quantities Sheet. Consider the following guidance when rounding:

- Use the same rounding methodology for a bid item in multiple projects or categories.
- Rounding should only be done once in a quantity table.
- If you choose to round the total, the summation of line items must match the quantity table subtotal.
- Plan quantities should never be more exact than can be measured in the field.
- Clearly defined and measured items should not be rounded or rounded to the lowest quantity range of [Table 3.3](#).
- The use of partial units is discouraged. However, partial units may be used for items measured by acre, mile (MI), or hundredweight (CWT). Partial units may also be used for items such as signs (SF) or beam guards (LF) due to the method of measurement for the items.
- If not directly stated in Table 3.3, round precision to the leading three numerical digits. For instance, 23,576 SY of erosion mat should be rounded to 23,600 SY.

**Table 3.3 Guide for Rounding Quantities**

| ITEM NAME                                     | UNIT       | QUANTITY RANGE |        |           |              |               |             |
|---|------------|----------------|--------|-----------|--------------|---------------|-------------|
|   |            | 0-10           | 10-100 | 100-1,000 | 1,000-10,000 | 10,000-50,000 | OVER 50,000 |
| "Each" and "Station" Items                    | EA, STA    | 1              | 1      | 1         | 1            | -             | -           |
| Clearing and Grubbing                         | IN DIA     | 1              | 1      | 10        | 10           | 100           | -           |
| Clearing and Grubbing                         | ACRE       | 0.01           | 0.1    | 1         | 10           | -             | -           |
| Removals                                      | SY, LF, CY | 1              | 1      | 10        | 10           | 100           | -           |
| All Excavation/ Granular Backfill             | CY         | 1              | 1      | 10        | 10           | 100           | 100         |
| Granular Subbase Course                       | CY, TON    | 1              | 1      | 10        | 10           | 100           | -           |
| Asphalt Stabilized Base Course/Shoulders      | SY         | 1              | 10     | 10        | 100          | 100           | 1,000       |
| Base Aggregate Dense                          | CY, TON    | 1              | 1      | 10        | 10           | 100           | 100         |
| HMA and Concrete Base Courses/Surfaces        | TON, SY    | 1              | 1      | 1         | 10           | 10            | -           |
| Concrete Surface Drains/Mortar Rubble Masonry | CY         | 0.1            | 1      | 1         | -            | -             | -           |
| Concrete Masonry                              | CY         | 1              | 1      | 1         | 1            | 1             | 1           |
| Prestressed Girder                            | LF         | 1              | 1      | 1         | 1            | 1             | 1           |
| Bar Steel Reinforcement                       | LB         | 10             | 10     | 10        | 10           | 10            | 10          |
| Structural Steel/Plates                       | LB         | 1              | 1      | 10        | 10           | 10            | 100         |
| Timber & Lumber                               | MBM        | 0.01           | 0.1    | 1         | -            | -             | -           |
| Piling  | LF         | 5              | 5      | 5         | 5            | 5             | 5           |
| Sheet Piling                                  | SF         | 1              | 1      | 1         | 10           | 10            | 100         |
| Culvert Pipe/Pipe Cattle Pass                 | LF         | 2              | 2      | 2         | 2            | -             | -           |
| Structural Plate Pipe                         | LF         | 2              | 2      | 2         | 2            | -             | -           |
| Concrete Sidewalk                             | SF         | 1              | 1      | 10        | 10           | 100           | -           |
| Slope Paving                                  | SY         | 1              | 1      | 1         | 1            | 1             | 1           |
| Riprap  | CY         | 1              | 1      | 1         | -            | -             | -           |
| Storm Sewer Pipe                              | LF         | 1              | 1      | 1         | 1            | -             | -           |
| Calcium Chloride, AG Lime, Mulching           | TON        | 0.1            | 1      | 1         | -            | -             | -           |
| Erosion Control Items                         | SY, LB     | 1              | 1      | 10        | 10           | 100           | 100         |
| Fertilizer                                    | CWT        | 1              | 1      | 10        | -            | -             | -           |
| Signs   | SF         | 0.01           | 0.01   | 0.01      | 0.01         | 0.01          | -           |
| Drill Holes, Well Casing Pipe                 | LF         | 1              | 1      | 10        | -            | -             | -           |
| Water   | MGAL       | 0.1            | 1      | 10        | 100          | -             | -           |
| Locating No-Passing Zones                     | MI         | 0.01           | 0.1    | 1         | -            | -             | -           |

**LIST OF ATTACHMENTS**[Attachment 3.1](#)

Quantity Reference Table

[Attachment 3.2](#)

FIIPS Quantities Update Form



**FDM 19-5-5 Construction Estimates**

August 15, 2025

The construction estimate is made up of unit cost and quantity for each bid item. Accuracy of each component influences the highway program by reducing uncertainty of funding and scheduling, as well as providing a benchmark for comparing bid prices.

WisDOT program stability relies on accurate estimates. Project schedules are based on the estimated cost of a project. WisDOT balances project-specific parameters during the fiscal year to ensure proper workloads and spending between regions, contract type (concrete, asphalt, structures), and funding sources. An accurate estimate allows WisDOT to make the best decisions with available funding.

- Estimates that are higher than the low bid may initially seem beneficial for the department, however, the savings is usually spent on projects that are designed on an accelerated schedule and may be constructed earlier than needed based on the service life of the roadway.
- Estimates that are lower than the low bid require extra funding and may result in rejecting the project or requiring WisDOT to delay work on other projects.

The estimate is a benchmark for reviewing the contractor's bid prices. Bids are analyzed before contracts are awarded to determine if the bids are acceptable. Bids compared with accurate estimates allow for straightforward bid analysis of the contract. Discrepancies between the bid and estimated prices require examination to determine the accuracy of both the estimate and the bid prices.

Designers are expected to produce a good estimate for each life cycle of the project. Update construction estimates regularly and at each life-cycle change depending upon region policy. Major items are recommended to be updated every six months, and the entire estimate needs to be updated annually. Early PS&E or advanceable projects need to be updated at the time of advancement or actual programmed PS&E.

A good estimate is thorough, reasonable and justifiable. It is developed using published department practices by an individual with the proper training; that is documented providing the parameters, assumptions and supporting information for the quantity and unit price determinations; and that is reviewed by an independent, third party who is also properly trained.

[Attachment 5.1](#) Construction Estimate Development Overview provides estimating guidance discussing significant items and estimate documentation. This document assists with outlining the steps and recommendations for developing construction estimates.

FDM 19-5 construction estimate guidance is based upon The Practical Guide to Cost Estimating, 1<sup>st</sup> Edition. The guide is an AASHTO publication that focuses on cost-estimating techniques. WisDOT employees may borrow a copy from region program controls or through the WisDOT library. Copies of the guide may be purchased from the AASHTO Store.

**5.1 Confidential Construction Estimates**

A construction estimate is always confidential, and the contractor's bid tab information is confidential until after the proposal is awarded. The release of this information may compromise the integrity of the competitive bidding process between the contractors and the Department. Individuals that knowingly release this information may be subject to discipline. Review the [confidentiality memo](#) at the [Estimating Webpages](#) for more information.

Before award, local participating agencies that fund a portion of a project may see construction estimate totals and general bid and estimate comparisons. This helps with their decision to move forward with the award of that project. There is risk sending confidential project costs to local participating agencies, because reports and minutes containing confidential project costs may become part of an open records request or posted online.

**5.2 Estimate Accuracy Performance Measure**

**Estimate accuracy is measured by one FHWA standard and two WisDOT standards:**

- 50% of the estimates will be within 10% of the low bid (FHWA).
- 60% of the estimates will be within 10% of the low bid (WisDOT).
- 75% of the estimates will be within 15% of the low bid (WisDOT).

The Engineer Estimate Accuracy Performance Measurement measures estimate accuracy, which is available on the [Estimating Performance Measures Webpage](#), DTSD performance management page under the Project development functional area or the [WisDOT MAPPS Page](#).

Estimate accuracy report percentages use the low bid as the denominator, and the justification emails discussed in [FDM 19-5-7](#) use the estimate as the denominator.

All new consultant contracts will include a component to evaluate a designer on estimate development and quality.

**5.3 Estimating User Group**

The objective of estimating user group is to review, develop and recommend WisDOT procedures and best

practices on cost estimating for projects. Under the leadership of the Proposal Management Section in the Bureau of Project Development, this includes cost estimate training, maintaining the Estimating Webpages and maintaining most of [FDM 19-5](#).

- [Estimating User Group Members](#)

#### 5.4 Estimate Types and Components

The department uses bid-based estimating for preliminary and final construction estimates. Bid-based estimating uses historical bid data to develop estimates.

Preliminary and final construction estimates are developed from the Project Initiation Phase to the Project Delivery Phase and may be revised at the start of the Project Proposal Execution Phase in LC20 during plan revisions or addenda ([FDM 3-1 Attachment 1.1](#)).

- Preliminary construction estimates include elements that are not yet fully defined, such as allowance items. Preliminary estimates are comprised of the following item types, and these item types are defined in the following sections.
  - Allowance items
  - Contingency item
  - Standard bid items
  - STSP bid items
  - SPV items
- Final construction estimates should not contain any allowance items and are comprised of the following item types:
  - Standard bid items
  - STSP bid items
  - SPV items

Bid items also are divided into two categories, significant items and non-significant items. **Significant items make up 80% of the project costs; or the top 20% of items, whichever comes first.** Non-significant items are the rest of the items that are not significant. See [FDM 19-5-6.6](#) for more information.

- In addition, bid items are divided into quantifiable and single unit items. Single unit items usually are measured by EACH.
  - Quantifiable items are measured or calculated in the field. Examples include Borrow (CY), HMA pavement (TON), culvert pipe (LF) and manholes (EACH).
  - Single unit items are not measured but are typically paid in full when completed. They may include multiple items. Examples include removing old structure (EACH), excavation for structures (EACH), Mobilization (EACH) and Traffic Control (EACH).

##### 5.4.1 Allowance Items

An allowance item is a known part of the construction estimate, but standard items have not been quantified. They are found in preliminary estimates. As plans are developed, the exact quantities for specific bid items are quantified, decreasing the use of allowance items. Allowance items usually include a class of items and are listed as an EACH SPV in preliminary estimates (SPV.0060).

- Examples include drainage, erosion control, signals, temporary traffic control, signs, and pavement marking items.
- Allowance items may be estimated using the latest Similar Projects Tool or past, similar projects. Use Calculating Percentage Items in [FDM 19-5-5.6.4](#) Unit Price Guidance.
  - The Majors Estimating Tool and Backbone Estimating Tool also may be used.
  - **Note:** The item class percentages provided in the Similar Projects Tool are not the same as the allowance percentages in Majors and Backbone Estimating Tools. The Similar Projects Tool percentages are based on the total bid price, and the Majors and Backbone Estimating Tool percentages are based on the cost of major roadway items.
- Design and construction engineering items are other allowance item examples that may be confused as contingency items. The construction estimate does not include design and construction engineering.

##### 5.4.2 Contingency Items

A contingency item is an estimated cost associated with identified uncertainties. Allowance and contingency items are often confused with one another. A basic definition for an allowance item is that it is a known,

unknown, and a contingency item is an unknown, unknown. Both terms are defined in Chapter 10 Definitions of the Practical Guide to Cost Estimating. As plans are developed, the use of contingency items decreases.

- Specific costs associated with risk adjustments from a risk assessment are common contingency items. A risk assessment may be completed with the Backbone and Major Projects Estimating Tools. Both tools are on the [Estimating Tools Webpage](#).
- State Highway Rehabilitation Projects usually do not have risk adjustment contingency items.

### 5.4.3 Standard and STSP Items

Standard bid items are listed in the [Standard Specifications](#), and Standardized Special Provisions (STSP) are listed in the [Standardized Special Provisions Webpage](#). These pages contain guidance for how to quantify these items. Otherwise, refer to [FDM 19-5-3](#) for additional bid item guidance.

- Quantifiable Standard and STSP unit prices are estimated in Estimator, Bid Express and similar projects. The Majors and Backbone Estimating Tools may be used but only in preliminary estimates.
  - For more information estimating asphalt pavement items, see Asphalt Pavement Items under [FDM 19-5-5.6.3](#) Bid Item Estimating Guidance.
- Mobilization and Traffic Control items should use the Similar Projects Tool, and similar projects also may be used.

### 5.4.4 SPV Items

Special provision bid items (SPVs) are non-standard items discussed in [FDM 19-15-80](#). SPV items are more difficult to estimate. Use standard bid items whenever possible.

- SPVs are more expensive.
- Contractors must interpret the SPVs, increasing risk and cost.
- Bid history is difficult to obtain if there is any.
- SPVs require extra work to create bid documents, administer in the field, and for the contractors to estimate.
- The special provisions for comparable projects must be reviewed to determine the differences between past projects and the current design to know if the unit price can be used to create an estimate.
- Non-standard items may be in short supply and are more expensive.

Consider using a specification modification for modifying an existing item. See [FDM 19-15-75](#), the Specification Modifications Section.

- Use Bid Express and similar projects to estimate quantifiable and single unit SPV items. Similar projects are preferred to estimate single unit SPV items.
- If there is not enough bid history, use cost-based estimating.

### 5.4.5 Cost-based Estimates

Cost-based estimating method use basic elements to develop a unit price like a contractor. Cost-based estimating elements include labor, equipment, materials, overhead and profit. **Talk to an experienced construction engineer to walk through methods; operations; and discussing hours, equipment and wages.**

- Direct costs for each task are developed with separate costs for the labor, equipment and material components of the work required to complete a task. Bid items are broken down into detailed task-by-task work activities. Remember, not all the labor and equipment will be used the entire time.
  - Labor includes crew size and makeup, production rate and labor costs. A mix of the crew is needed, and they all get paid differently, such as operators, labors, and apprentices. Wage rates and fringe benefits on federally funded work are defined in the prevailing wage rates in ASP-9 or the federal wage rate addenda. Wage rates are listed under WI10, WI15 or WI18 of Davis Bacon prevailing wage rates.
  - Equipment includes production rate, equipment costs and fuel costs.
    - Both the Rental Rate Blue Book and the AED Green Book provide equipment cost data. Check whether operator costs are included.
    - The costs of small power and hand tools and miscellaneous non-capitalized equipment and supplies are usually estimated as a percentage of the labor cost. Such allowance can range as high as 12 percent of direct labor cost but is usually much lower.
    - Materials include haul distances, fuel costs and site storage.
    - Do material quotes include delivery? The contractor is usually required to off-load, handle

and stockpile, or warehouse materials on site.

- Material waste must be accounted for. Waste can be assumed to be 2 to 10 percent, but it is better to carefully consider specific conditions of the item.
- Overhead Expenses may range from 7% to 10% depending indirect labor costs and general overhead.
  - Indirect labor are wages and labor cost fringes paid to contractor personnel whose effort cannot be attributed to a specific construction task. Personnel such as superintendents, engineers, clerks, and site cleanup laborers are usually included as indirect labor costs or project overhead.
  - General overhead expenses are those incurred by the contractor in the overall management of the business.
- Profit margins generally range from 3% to 10%, but this level can vary greatly depending on competition, perceived risk and expected project duration.

Estimator has cost sheets built into the application to assist in the development of bid item cost using the cost based estimating method.

The above guidance and additional cost-based estimating guidance is found in Chapter 4: Cost-Base Estimates of the [Practical Guide to Cost Estimating](#).

#### **5.4.6 Bureau of Structure Estimates**

For structures designed by the Bureau of Structures (BOS), BOS staff will provide the estimate and estimate documentation for structure items. Regions should still review and verify prices with current trends and any bid items that also are in the roadway portion match. Regions may adjust structure estimates as they see fit, especially after PS&E. BOS staff typically do not review their estimates after PS&E and may be contacted if region staff have estimate questions for structure items.

### **5.5 Tools and Resources**

Below are the estimating tools currently used by WisDOT.

#### **5.5.1 Primary Tools**

The following are main tools used by WisDOT for developing unit prices in construction estimates. [Table 5.1](#) shows what estimating tools to use for each item type.

#### **AASHTOWare Project Estimator**

- Estimator is WisDOT's preferred method for selecting an initial estimated price for standard, measurable bid items. Estimator is a cost estimating tool that is part of the AASHTOWare software suite. It is a desktop application that needs to be installed onto a computer. Estimator uses a regression price model based upon economy of scale. As quantities increase, the unit price decreases. If there is enough bid history, regression prices account for multiple variables, including location of project, work type classification, and quantity of item. The last three years of bid history are used in Estimator Catalogs, and these catalogs are updated every three months.
- Estimator is used to help designers determine the overall construction project cost. It divides the estimate into various categories. This desktop application can import and export estimates electronically between Quantities 2 Plans or AASHTOWare Preconstruction.
- If there is enough data, Estimator will automatically inflate regression prices to the Base Date.
- The [AASHTOWare Knowledge Base Site](#) has step-by-step guidance to [create a construction estimate in Estimator](#). Verify that you are using the most current Estimator catalog.
  - Consultants must download and install catalog updates from the [AASHTOWare Project estimator Catalog File Section](#) of the Estimator Installation Site.
  - WisDOT staff will need to contact BITS-CITS staff for access. They have the current catalog available. Catalogs are updated after each catalog release. However, existing Estimator does not automatically update estimates with new catalogs.
- [WisDOT user guide to merge Estimator files](#).

#### **Bid Express**

- Bid Express is an online, searchable database of historical bid data developed by Info Tech Inc. An account is required. The database can be used to find average cost information for specific bid items, search for keywords in bid item descriptions, and review awarded contracts. The data search can be tailored to include a specific date range, specific bid items or item descriptions.
  - DOT employees have access to Bid Express by requesting login ID and password from the [hcci.dtid@dot.wi.gov](mailto:hcci.dtid@dot.wi.gov) mailbox. Include your name, email address, and phone number in your request. Regions requesting access for multiple users should submit one spreadsheet with

requested information to the HCCI mailbox.

- Consultants are not covered under the WisDOT license agreement. They need to acquire their own license to use Bid Express.
- [Bid Express User Guide](#)
- [Bid Express Excel Example](#)

#### Similar Projects Tool

- The Similar Projects Tool is an Excel file created and updated by Bureau of Project Development. This tool uses bid history that can be filtered by a variety of criteria. The results include mobilization percentages, traffic control costs, item class percentages for allowance items, and project information. The Similar Projects Tool is available on the Estimating Tools Webpage.
- See Calculating Percentage Items in [FDM 19-5.5.6.4](#) for calculating percentage item prices.
- [Similar Projects Tool Instructions](#): The same instructions are found within the Excel file.
- The Similar Projects Tool can be used to find past projects with similar scope, location, and project complexities. Proposal IDs and Controlling Construction IDs are listed.

#### Asphalt Pricing Map

- **The Asphalt Pricing Map is an internal facing tool that** uses an ArcGIS analysis to develop a unit price model. It is created and updated by Bureau of Project Development. Project information comes from the Similar Projects Tool. The asphalt unit price model uses historic hot mix asphalt (HMA) pavement prices from projects let **within that last two construction seasons** with more than 1,300 TONS of total HMA. The unit prices are the combined HMA pavement prices for each contract. **The asphalt unit price model provides historical bid prices adjusted to** current year dollars using the Wisconsin DOT Chained Fisher Construction Cost Index and do not need to be inflated.
- The Asphalt Pricing Map may be used with Bid Express.
- For more information estimating asphalt pavement items, see Asphalt Pavement Items under [FDM 19-5.5.6.3](#) Bid Item Estimating Guidance.

#### Quantities 2 Plans

- Quantities 2 Plans (Q2P) is an Excel Add-in with its own command ribbon that assists the user in quantity computations, comparing various bid item unit prices, creating miscellaneous quantity tables, and building & maintaining the construction estimate. Estimates and quantities maintained in Excel can be exported to Estimator or AASHTOWare Preconstruction (AWP) and vice versa. **Q2P does not replace any estimating tools but is a tool to organize and electronically transfer information between miscellaneous quantity tables and construction estimates.**
- The [Q2P Webpage](#) contains a user guide, installation instructions, installer, and support information.

**Table 5.1 Tools to Estimate Each Item Type**

|                                      | Estimator | Bid Express | Similar Projects Tool | Asphalt Price Map | Similar Projects <sup>1</sup> |
|--------------------------------------|-----------|-------------|-----------------------|-------------------|-------------------------------|
| Allowance Items                      |           |             |                       |                   |                               |
| Quantifiable Standard and STSP Items |           |             |                       |                   |                               |
| Single unit Standard and STSP Items  |           |             |                       |                   |                               |
| Quantifiable SPV Items               |           |             |                       |                   |                               |
| Single unit SPV Items                |           | 2           |                       |                   |                               |
| <b>Specific Bid Items</b>            |           |             |                       |                   |                               |
| HMA Pavement                         |           |             |                       |                   | 3                             |
| Mobilization                         |           |             |                       |                   |                               |
| Traffic Control                      |           |             |                       |                   |                               |

**Legend and Notes**

|  |   |
|--|---|
|  | Recommended tool to estimate item type.                     |
|  | Tool works in some instances. Other tool(s) should be used. |
|  | Tool not recommended to estimate item type.                 |

Note: Item types are defined in [FDM 19-5-5.4](#). Significant items need more than one source for an estimate price. All items listed in in Table 5.1 have at least to primary tools that are recommended.

1. (Similar Projects Column) Similar projects are not an estimating tool but are used in estimate development. Similar project guidance is found in [FDM 19-5-5.6.1](#).
2. Results may not be similarly scoped. Similar projects likely are needed to find similarly scoped items.
3. Similar projects may not be in a similarly priced, geographic area.

**5.5.2 Other Tools and Resources****Estimating Webpages**

- [Estimating Webpage](#): Contains the confidentiality memo and estimating user group member information.
- [Estimating Performance Webpage](#): Contains the estimate accuracy report, a link to the on-budget performance MAPSS measure, and other performance measures.
- [Estimate Development Webpage](#): Contains the estimate documentation template and guidance document, some historic bid data, justification guidance, the production rate tool, the Wisconsin DOT Chained Fisher Construction Cost Index, recent estimating trends, and work classifications that dictate the types of contractors are able to bid on proposals.
- [Estimating Tools Webpage](#): Contains links and guidance for all tools maintained by Bureau of Project Development and Division of Transportation Investment Management.
- [Estimate Training Webpage](#): Contains available construction estimate training videos and past presentations. The training videos are based upon [FDM 19-5](#) along with tools and resources linked in this FDM section.

**[Bid Item List](#)**

- The bid item list is an Excel file that contains a list of all standard, STSP and SPV bid items. This list contains current and obsolete bid items and can be used to find recently obsoleted item numbers that new items have replaced. Obsolete bid items shall not be used.

**Plans, Proposals, Addenda and As-builts**

- For October 2021 and earlier, let plans and proposals are available on the [Plans and Proposals FTP Site](#).



- All let plans, proposals and addenda are available on the [Highway Construction Contract Information \(HCCI\) Pages](#). The following are steps to navigate to plans, proposals and addenda:
  - After entering the [HCCI](#) Page, select Bid letting on the left menu.
  - Scroll down to the *Bid letting information by letting date* bullet list and select the desired letting year.
  - In the *bid lettings information by date* table, select the desired letting month.
  - Let plans and proposals are in the Pre-bid information Section under Plans and Proposals. Either the files are linked directly for each proposal or they are in an FTP Link.
  - Addenda are in the Addenda Section by Call Number or the last three numerical digits of the Proposal ID.
- For November 2021 and more recent, let plans, proposals and addenda are only available on the HCCI Page.
- Department staff have access to as-builts on the DOTView GIS Application in [Geoportal](#).
- The proposal ID is made of eleven numerical digits. The first eight digits are the letting ID, which is the letting's year, month and day. The last three digits is the call number. For instance, proposal ID 20210309004 was let on March 9, 2021 and was the fourth proposal in the letting.

### Structure Costs

- [WisDOT Bridge Manual Chapter 5; Economics and Costs](#) contains factors governing bridge costs, economic span lengths and bid letting cost data.
- [Structure Cost Summaries](#) contain cost information by structure type in an Excel file for each calendar year.
- The [Highway Structures Information System](#) (HSI) may be used to find similar bridges.
  - A WAMS ID is required. In the initial search screen, advanced search options are available after selecting "assist" in the small dropdown in the top-middle of the page. After selecting assist, more search options are available by select the "+" symbol right of the "Reset" Button on the bottom. Hold control to select multiple options of a characteristic. Reset Button on the bottom. Hold control to select multiple options of a characteristic.
  - Additional structure information and plans are available for each search result.
  - An [HSI Quick Guide](#) is available.

### Past Bid Results

- Past bid results are on the Highway Construction Contract Information (HCCI) Webpages. The past bid results could be used to compare the design project to past projects with similar scope, location, and project complexities.
- Choose a past letting date and select all bids received.
- Past proposals are also accessible through Bid Express.

**Preliminary estimating tools** developed by Program Development and Analysis in Division of Transportation Investment Management

- [Major Projects Estimating Tool](#)
  - Cost estimating tool to assist in preparing accurate total project cost estimates from planning to 30% complete for major projects.
  - [Cost estimating software user manual](#)
  - [Presentation](#): Majors cost estimating tool workshop, Cost estimating tool overview (Jan. 19, 2012).
- [Project Estimating Tool](#): An example of a cost estimating tool to assist in preparing accurate total project cost estimates from 30% to 60% complete.
- [Backbone Project Estimating Tool](#): Cost estimating tool to assist in preparing accurate total project cost estimates for backbone projects.

### Find Bid Data

- Find Bid Data is within AASHTOWare Project Preconstruction and like Bid Express, is an online, searchable database of historical bid data.
- Bid Express should be used instead of Find Bid Data. The following are concerns with using Find Bid Data by designers:
  - Find Bid Data is not as straight forward as Bid Express.

- Search results do not provide item numbers, descriptions or supplemental descriptions, so the results cannot be confirmed to be correct.
- Text cannot be highlighted or exported into Excel.
- Estimate prices are included in the search results, which are confidential. Designers should be reviewing historic bid prices, not estimates.
- Reviewers may want to use Find Bid Data in their reviews, since estimate prices are provided in projects once they are entered into AASHTOWare Preconstruction.
- [The AASHTOWare Knowledge Base Website](#) has basic guidance for this tool.
- Advanced criteria needs to be used instead of system defaults to search supplemental descriptions for SPVs and limit results to recent bid prices.

### Price Items

- **Caution:** Pricing items project-wide, for a category or for each item will automatically overwrite and save the new regression prices. You cannot review the regression prices before they are saved. Pricing all items within a project or category should not be used. Otherwise, [export the estimate](#) before Pricing Items.
- AASHTOWare Project (AWP) Preconstruction Price Item prices provide basic Estimator regression prices. Price Items in AWP does not account for project work type, region, season or inflate prices according to base date. Estimator will account for these factors if there is enough bid history.
- Price Items can be used after PS&E. If a non-significant measurable bid item is added after PS&E, Price Items can be used to find a regression price.
- The [AASHTOWare Knowledge Base Website](#) has basic guidance for this tool.

### Statewide Average Unit Prices

- Statewide average unit prices should only be used for conceptual estimates, and not as a source for the PS&E estimate. The statewide average unit prices do not take into consideration the factors of quantity, location, or other project characteristics, so the information is not specific enough for the PS&E estimate. The past three years of average prices are available on the WisDOT HCCI Webpages.

## 5.6 Construction Estimate Development

### 5.6.1 Similar Projects

When choosing similar proposals/projects, it's generally not for a single item, but for a category of items, a construction method or type of work that is similar to your project (i.e., unique construction staging, temporary structure, retaining wall, nightwork, etc.).

The [Similar Projects Tool](#) can be used to find projects based on various filters such as: Improvement Type/Concept, Work Type/Rating, Region, County, and more.

### 5.6.2 Project Characteristics

Project characteristics influence the bid prices and should influence the estimate. The more contracts have short production runs, traffic shifts, constrained schedules, the higher bid prices could be. Keep in mind, historic bid prices for any item is a blended price that included many of the factors below.

Designers often account for project risk or complexities in multiple locations within an estimate, which generally increases the overall cost of the estimate over and above a reasonable bid price. Be careful not to adjust for multiple factors with the same underlying factor, such as increasing estimate prices for expedited schedule and night work. Choose unit prices based upon the characteristics of your project within range of historic prices.

### Schedule and Road User Costs

- **The letting date does influence bid prices.** Bids are typically higher in the spring and summer months. Contracts let closer to when work is scheduled to begin will see higher bid prices, and contractors are focused on their on-hand work. Competition decreases in April and May lettings as contractors fill up with work before a construction season, which leads to higher prices.
  - For contracts less than \$10 million, November through March letting months have higher estimate accuracy or the bids are low. Contractors are concentrating on bidding for work in the next construction season and bid aggressively.
  - A contract more than \$10 million usually can be in any letting month. Larger contractors who bid on larger contracts likely have dedicated staff for developing bids.
  - Review [Attachment 5.2](#) for recommended letting months by Improvement Strategy. If the letting date can be moved and the letting still has capacity, move the project's letting into a more favorable letting.

- The more the contractor's construction schedule is dictated in the contract (i.e. interim completion times, completion dates and liquidated damages), the higher bid prices will be. Seriously evaluate the need for dictating the final and interim completion times, and ensure the requirements are not already covered in the standard specifications.
  - The contractor has additional risks, especially if something happens out of the contractor's control, such as weather, natural disasters, labor or material shortages. Additional risk translates into higher unit prices.
  - Higher bid prices occur when multiple crews are required with an accelerated schedule. Mobilization costs increase and each crew is completing shorter runs, decreasing production rates and increasing costs. Not all contractors have multiple crews available, and an accelerated schedule will limit competition, which also leads to higher costs.
  - **An accelerated contract dictated in the contract does not mean the work will be completed on time.** The contractor may not be able to follow the accelerated schedule and they might increase bid prices to include liquidated damages, especially if there is little or no competition. In these cases, the Department is indirectly paying the contractor's liquidated damages. Mobilization is usually bid higher.
  - Estimate prices should reflect the additional effort that contractor will need to make. Requirements such as overtime, multiple crews and additional equipment will impact the cost of the project. Do not increase individual bid items along with single unit items, such as Traffic Control and Mobilization. Only one or the other should reflect the additional costs the contractors are encountering.
- Multiple season contracts will have higher unit prices for items completed in later seasons. Consider material cost volatility; increased labor, fuel and equipment costs; and weather risks.
- Use the [Production Estimation Tool](#) in [FDM 19-10-30.3](#) to develop a reasonable construction schedule.
  - **Production Rates have inverse correlation with unit prices. As production rates decrease, unit prices increase.**

#### Traffic Control (Construction Staging)

- How much work is getting completed in each stage? Long production runs will see high production rates and lower unit prices, and short production runs will see low production rates and higher unit prices.
  - How many mobilizations are required for equipment, material and labor? The Mobilization Bid Item will be higher with additional mobilizations.
  - **Bid prices usually are closer to the quantity being completed in each stage, mobilization or location instead of the entire contract.** Use a weighted average when calculating the unit prices of items in multiple stages.
  - Mainline closures typically see the lowest unit prices and highest productions rates unless local, urban traffic is to be maintained.
- Nightwork and nightly lane closures have higher costs due to lower production rates, extra safety costs, lighting, mobilizing equipment each night.
- Working under traffic also has lower production rates and increased costs.

#### Construction Conflicts

- Construction conflicts that may impact the critical path work schedule will impact unit prices, especially if the project has interim and final completion dates. Mobilization and items impact in the critical path are usually bid higher. Higher mobilization bid prices can be due to perceived risk if the contractor is expected to pay liquidated damages, and bid items are higher if production rates need to be higher with multiple crews or longer hours. These possible areas could cause construction conflicts: utility, DNR and railroad coordination; hazardous materials; and archeological monitors.
- When there are conflicts, such as underground and overhead utilities, being constructed with construction projects, contractors' productivity might be reduced when working around the conflicts which will increase the bid item price of the items that need to be completed around the conflicting utility.

#### Competition

- Competition plays a critical role in bid prices. Strong competition will generally result in aggressive bid prices. As competition increases, prices tend to decrease. The [Estimate Accuracy Report](#) compares total bids and estimates in the Percent Over (Under) by Number of Bidders Graph.
- Certain work types have less competition. For example, asphalt producer locations are controlled by

material sources (pits and quarries), so the location of the project drives who will bid on a proposal.

- The Similar Projects Tool and reviewing past, similar projects may be used to estimate competition. The Similar Projects Tool does provide the average number of bidders in the results of filtered projects. Plan holders and eligible bidders are available on the HCCI Webpages or Bid Express.

### Other Considerations

- When projects are more than 10 miles apart, they usually do not see cost savings when they are bundled. Unit prices are typically closer to pricing quantities for each project, location and each construction stage. When projects are being constructed at the same time and are within 10 miles of each other, there tends to be a cost savings.
- Urban projects are typically more expensive for the following reasons.
  - Lack of staging areas require more frequent material and equipment deliveries, increasing mobilization and other item costs.
  - Working around pedestrian and local traffic accommodations may keep production rates low and costs high when most work is done in piecemeal with low production rates.
  - Buildings or traffic close to the roadway means the contractor must work carefully with large equipment, decreasing production rates and increasing costs.
- Constrained work environments could be in a rural area due to limited right-of-way or project access. Increase mobilization accordingly. You may need to increase impacted items if the constrained work environment impacts production rates.
- The [Transportation Improvement Program ArcGIS Online Map](#) shows upcoming projects and their location. Open the legend to find the color that corresponds to when your project is being let or constructed.
  - Bid prices are typically lower if there is similar work within about 10 miles of the project.
    - The contractor can move crews and equipment between projects.
    - The contractor orders more material giving them a lower material cost.
    - Small projects near other projects with similar work will typically get lower bid prices, and small projects not close to other projects typically will be higher.
    - However, a nearby project may not result in lower bid prices with different work types and different contractors.
  - If there is similar project within 10 miles of your project, you may want to bundle the projects especially if your project has less than 30,000 tons of asphalt.
- Consider where suppliers are located compared to the project, such as asphalt and concrete plants, availability of earthwork on site, and haul distances for waste material.
- Current bid item trends may be reviewed in the [Recent Estimating Trends](#) Document.

### 5.6.3 Bid Item Estimating Guidance

The following information should be considered when determining unit prices for individual items. These considerations are not all-inclusive but provide a starting point.

#### Removing Asphaltic Surface Milling (204.0120 & 204.0125)

- Average and regression prices are not recommended to be used.
  - If the millings can be reused, prices are lower than average.
  - If the millings cannot be reused due to a sealcoat, long haul distances or the construction schedule is constrained, prices are higher than average.

#### Hot Mix Asphalt Pavement Items (460)

- **A project's geographic location and the mix design(s) will influence HMA unit prices.**
  - Geographic areas **and contractor competition should be considered when developing preliminary estimates.** The [Asphalt Pricing Map](#) provides price ranges that should be used for the initial estimate.
    - In preliminary estimates, the Asphalt Pricing Map may be used, especially if the asphalt pavement mix design is not known.
  - In final estimates, the Asphalt Pricing Map can be used to **validate HMA estimated prices by comparing the project estimate with nearby counties. When determining final estimate prices also use Bid Express or similar projects. Additional consideration should also be given to whether genuine contractor competition may exist for a specific project.**
- Average price differences by mix characteristic are provided in the [Recent Estimating Trends](#)

Document.

- Estimates may be adjusted for mixes that are more commonly used, but the price for only one mix characteristic or an average of multiple mix characteristics should be used.
- HMA pavement projects may have higher asphalt prices if the project has less than 10,000 TONS of total HMA. Higher prices should be considered if the project is not located close to an established asphalt plant. Use of a mobile asphalt plant or additional hauling costs will affect prices more with lower quantities.
  - Projects with less than 1,300 TONS of HMA should not use the Asphalt Pricing Map. There is greater price volatility on projects with minor HMA quantities.
  - The [Similar Projects Tool](#) may be used to find projects with similar quantities. It has total HMA pavement in Column T of the Data Sheet.
- Reviewing asphalt prices: The following steps are recommended to quickly get reasonable asphalt unit prices for reviewing estimates prices or for preliminary asphalt prices. When determining final estimate prices, also use Bid Express or similar projects.
  1. Review the [WisDOT Chained Fisher Construction Cost Index](#) to see if costs are increasing, decreasing or neither. Page 3 contains the Asphalt Construction Cost Index.
  2. Review project location using the [Asphalt Pricing Map](#).
  3. Review mix design, production rates and quantities. Statewide average price difference for HMA pavement mixture characteristics for the past year are in the [Recent Estimating Trends](#) Document. Production rates are discussed in Schedule and Road User Costs and Other Consideration in [FDM 19-5-5.6.2](#) Project Characteristics, and quantities are discussed earlier in this section.
  4. HMA estimates should consider the WisDOT Chained Fisher Construction Cost Index, geographic location, proximity to other projects, availability of materials, mix design, production rates, and project quantities.

#### Concrete Masonry Bridges (502.0100)

- The two main factors that influence prices is the bridge type and the contractor. Average and regression prices are not recommended.
  - Each contractor will balance their bid differently between Concrete Masonry Bridges, Removing Structure, and Excavation for Structures items. All three items should be estimated at the same time with the same bid data.
  - Bid prices are higher with lower production rates. Prices will be higher if formwork is more difficult to complete, especially if there is only work on the superstructure.
    - Concrete slab-span bridges typically receive bids lower than average.
    - Girder bridges typically receive bids at about the average price.
    - Rehabilitated bridges typically receive bids higher than average.
- The [Similar Projects Tool](#) and [Bid Express Bid Tab Analysis Page](#) may be used to find recent, similar bridges using the “Copy Proposal IDs for BidX Button” in the Similar Projects Tool.
  - In the Similar Projects Tool, the Improvement Type Filter may be used to obtain a Proposal list of proposals that are bridge rehabilitations or bridge replacements. This separates proposals with bridge rehabilitations and bridge replacements. Other filters may be used.
  - Press the “Copy Proposal IDs for BidX Button” and paste the proposal ID list in the Proposal Items Field of the Bid Express Bid Tab Analysis Page
  - In the Item Field, enter the first portion of the In Bid Express and other search fields.
    - If the Item Field is left blank for a search, the Bid Express search results will not work.
    - If proposals with similar bridge replacements need to be found, search for bid items only found in slab-spans or girder bridges, such as prestressed girder items. Bridges with other unique criteria may need to use the Highway Structures Information System. Finding slab-span bridges will be a process of eliminating proposals with other bridge types such as girders bridges.
    - Structure plans will need to be reviewed to verify similar structures have been found. See Plans, Proposals, Addenda and As-builts in [FDM 19-5-5.5.2](#) Other Tools and Resources to find bridge plans by proposal ID.
- The [Highway Structures Information System](#) (HSI) may be used to find similar bridges. The HSI



is not updated until the bridge has been built, but it contains more search criteria. For more information, see Structure Costs in [FDM 19-5-5.5.2](#) Other Tools and Resources.

**Concrete Masonry Overlay Decks (509.2500)**

- Special crews and equipment are required to complete this item. The Department is aware of only two contractors that can complete this work, Zenith Tech., Inc. and Lunda Construction Company. Bid prices will vary depending upon the constraints to complete this item in your project and their availability with their current workload.

**Temporary Structures (526.0100)**

- Temporary structures for areas with past flooding issues that are built as bridges instead of culverts should have a higher estimate than other drainage structures. Try to find a similar project and increase the estimate accordingly.

**Mobilization (619.1000)**

- What crew and equipment are required to complete the work? Project size, location, construction stages all influence contractor's bid for mobilization. A common method for estimating the Mobilization bid price is as a percent of the total construction estimate. The Similar Projects Tool and tables showing median mobilization percentages for past proposals by improvement type in the [Estimating Tools Webpage](#). Similar sized projects should be compared in the similar projects tool for more accurate mobilization percentages. Although these resources help determine a starting point, the estimated Mobilization bid price should be adjusted for project specific details. The Similar Projects Tool contains a large table of various proposal characteristics.
- See Primary Tools in [FDM 19-5-5.5](#) Tools and Resources for links and information about the Similar Projects Tool.
- See Calculating Percentage Items in [FDM 19-5-5.6.4](#) for calculating Mobilization price.

**Handwork**

- Item quantities completed by hand instead of a machine have low production rates and are typically 2 to 2.5 times more expensive than being completed by a machine. This is true for items completed at spot locations such as curb ramp items or median reconfigurations. Blend costs for completing quantities by hand and by machine. See Blending Unit Prices in FDM 19-5-5.6.4 Unit Price Guidance.

**Unbalanced bids**

- An unbalanced bid involves the shifting of dollars between bid items until the unit price does not reflect a reasonable cost for each item. FHWA defines two types of unbalanced bids, mathematically unbalanced bids and materially unbalanced bids.
  - Mathematically unbalanced bids contain bid items with unbalanced unit prices, but the final cost of the contract is not impacted. This type of unbalanced bid is legal.
  - Materially unbalanced bid also contain bid items with unbalanced unit prices, and the final cost of the contract is increased. This type of unbalanced bidding is illegal.
- How should items be estimated where costs can easily be shifted between items? Contractors often estimate a total cost to perform their work and distribute the total cost amongst their items. How they distribute the costs is often different in each project and for each contractor. For instance, one contractor will distribute higher costs for single unit items and lower costs for the remaining, measurable items (High cost for Structure Excavation and lowers costs distributed for measurable earthwork and aggregate items).

**5.6.4 Unit Price Guidance****Rounding Unit Prices**

- Prices shall be rounded according to the engineer's confidence in the estimate price. Roughly estimated items should have the unit price rounded to one or two leading numerical digits. Estimate prices usually do not need more than three leading numerical digits.
- Example: A regression price of \$34.18 should be rounded to \$35.

**Regression Prices**

- In Estimator, how did the project quantity fit into the item regression curve? Estimator curves are most reliable between the 25% and 75% quartiles. Other estimating tools are recommended if quantities are outside the 25% and 75% quartiles.
  - For high quantities, the regression price may be low. Bid prices will reach a minimum price, but the regression curve will continue to decrease. Reviewing historic prices in Bid Express will be more reliable.



- For low quantities, bid prices usually significantly vary.

### Calculating Percentage Items

- Allowance Items, Mobilization, and sometimes Traffic Control are estimated as a percentage of the total estimate. The [Similar Projects Tool](#) contains the expected ranges of percentages in the results of filtered projects.
- Example for calculating Mobilization with Traffic Control: For a project with \$2 million of known items (i.e. not including Mobilization and Traffic Control). The similar projects tool was used to find the percentages in this example. Mobilization is estimated at 5% and Traffic Control is estimated at 1% of the total construction estimate.

$$Total = (known\ items) + (5\% \times Total) + (1\% \times Total)$$

- Rearranging this equation, the following generic equation can be used to find the Total:

$$Total = \frac{(known\ items)}{(1 - \sum percentages)}$$

$$Total = \frac{\$2\ million}{1 - (0.05 + 0.01)} = \frac{\$2\ million}{0.94} = \$2,127,659.57$$

$$Mobilization = 5\% \times \$2,127,659.57 = \$106,382.98\ or\ \$110,000\ rounded.$$

$$Traffic\ Control = 1\% \times \$2,127,659.57 = \$21,276.60\ or\ \$21,000\ rounded.$$

- This equation may also be used with allowance items in preliminary estimates using percentages found in the similar projects tool. There is no limit to the number of percentage items that can be calculated.

### Blending Unit Prices

- Blend prices based on total proposal quantity. The blended price is the total bid item amount from all projects divided by the total quantity.
- Example: Two projects in one proposal have Excavation Common.
  - Project 1 has 10,000 CY of Excavation Common estimated at \$6/CY for \$60,000.
  - Project 2 has 1,000 CY of Excavation Common estimated at \$12/CY for \$12,000.
  - The total bid item amount is \$72,000, \$60,000 + \$12,000.
  - The total quantity is 11,000 CY, 10,000 CY + 1,000 CY.
  - The blended price is \$6.54, \$72,000/11,000 CY. The final blended price should be rounded to \$6.50.

### Adjusting Unit Prices

- The [WisDOT Chained Fisher Construction Cost Index](#) (WisDOT CCI) provides an indicator of construction cost escalation over time and can be used to convert past bid history into current dollars. This index has a base year of 2010. The WisDOT CCI is updated each quarter by calendar year.
- [Understanding the WisDOT Chained Fisher Construction Cost Index](#) contains additional information about the WisDOT CCI.
- **Do not forecast prices past the current date.** Use the current WisDOT CCI value. Region programming will inflate the projects into future dollars.
- The WisDOT CCI should only be used to convert past prices into current dollars without recent bid history. The WisDOT CCI shows trends for all items and cost trends vary for each bid item. Adjusting prices using the WisDOT CCI is approximate but will provide a better estimate of inflated costs than assuming an inflation rate or not adjusting at all. Recent price trends for bid items will always be more reliable.
- Use a ratio from past and current WisDOT CCI values to convert past prices into current dollars. The equation is outlined below.

$$\frac{Current\ Index\ Value}{Past\ Index\ Value} \times Past\ Bid\ Price = Current\ Bid\ Price$$

- Example: A current project has a bid item that has not been used since March 2011, and the bid price was \$870/LF. The index value for 2011 quarter 1 is 103.1, and the index value for 2019 quarter 2 is 140.8. Plug these values into the above equation as shown below. The current price is \$1,188 or about \$1,200.

$$\frac{140.8}{103.1} \times \$870 = \$1,188$$

- This method for adjusting prices using the WisDOT CCI comes from the [RS Means Historical Cost](#)

[Indexes Article.](#)

- Estimator prices do not need to be adjusted. Estimator catalogs already adjust prices into current dollars when there is enough bid history.

## 5.7 Contract Document Bid Impacts

Good plans and contract documents encourage good bids. We all strive for it. Approach your plan with the understanding that the contractor and field staff were not involved in the design process. It is important to have clear, thorough contract requirements.

### 5.7.1 Errors and Inconsistencies

The estimate should be reviewed for typing errors and inconsistencies.

- Typos usually increase/decrease the unit price by a factor of 10 or 100, which can cause a significant change in the overall estimated price of a proposal. Errors like this are a great example of why an independent check should be performed on an estimate and is an easy thing to check for to increase our engineering accuracy.
- Ensure names for construction details, plan notes, miscellaneous quantity notes, specials, etc. are consistent.

Confidence decreases in the plans as more addenda are needed to address errors. With the decrease in confidence the contractor will put more risk into their bid.

### 5.7.2 Ambiguity and Risk

Remove contractor risk from the PS&E documents that may affect estimate prices by addressing uncertainty in the plans, specifications, and schedule. The more uncertainty or risk in a proposal, the greater chance the contractor will increase the bid cost to protect against financial loss. For instance, traffic control items will have higher risk and cost if there is ambiguity in the traffic control plan or there is not enough room in the work area for contractors to perform the work. Another area that causes uncertainty is when the payment method isn't clearly defined in the SPVs.

### 5.7.3 Incidental Items

Items that are incidental to the contract still cost money for the contractor to complete. Avoid incidental items if pay items exist. If incidental items are necessary, include the costs to complete incidental work in the respective bid items.

## **LIST OF ATTACHMENTS**

|                                |  |
|--------------------------------|--|
| <a href="#">Attachment 5.1</a> | Construction Estimate Development Overview         |
| <a href="#">Attachment 5.2</a> | Recommended Letting Months by Improvement Strategy |

## **FDM 19-5-6 Construction Estimate Documentation Report**

May 17, 2021

Estimate documentation is required for all WisDOT let proposals. The purpose of the documentation is to provide a record of the decisions made during the development of the proposal cost estimate. Reviewers will use the documentation during the estimate review process as outlined in [FDM 19-5-7](#). The documentation should also reflect modifications made by the project team during the final estimate development and review.

The estimate documentation report is a required exhibit to be submitted with a let project PS&E to central office as described in [FDM 19-10-1.2.1](#). The latest [Estimate Documentation Report Template](#) is found on the [Estimate Development Webpage](#).

The current template includes the following information:

- Estimate Documentation Information
- Executive Summary
- Estimating Tool Parameters
- Similar Projects or Proposals
- Project Characteristics
- Item Level Documentation
- Attachments

For additional estimate documentation guidance and examples, refer to the [estimate documentation guidance document](#) on the [Estimate Development Webpage](#).

## 6.1 Estimate Documentation Information

At the top of the first page, enter requested information in the fields. How was it decided to list multiple projects?

## 6.2 Executive Summary

Describe the project scope. Provide a summary of proposed work, including reconstruction segments, rehabilitation segments, number of various structures and the major factors that could potentially impact the estimate.

Select the project's Improvement Strategy. See [FDM 3-5-1.1](#) for definitions. Select all that apply when there are multiple project IDs in one estimate documentation.

## 6.3 Estimating Tool Parameters

1. Estimator Parameters. Document the use of the Estimator parameters shown below.

|                   |                      |                      |
|-------------------|----------------------|----------------------|
| Work Type:        | <input type="text"/> | <input type="text"/> |
| Highway Type:     | <input type="text"/> | <input type="text"/> |
| Urban/Rural Type: | <input type="text"/> | <input type="text"/> |
| Season:           | <input type="text"/> | <input type="text"/> |
| County:           | <input type="text"/> | <input type="text"/> |
| District:         | <input type="text"/> | <input type="text"/> |

2. Bid Express and Other Tool Parameters. List the general parameters. Variations of these should be noted in the item price documentation.
3. Refer to the [AASHTOWare Knowledge Base Website](#) for guidance on how to fill out this table.

## 6.4 Similar Projects or Proposals

Use the recommended table to list the similar projects and information used to develop the estimate. Provide a brief explanation for how each project is similar and what items prices were compared.

## 6.5 Project Characteristics

Enter information related to each section of project characteristics. The following are different sections of project characteristics. Discuss in unit price justification characteristics that impacted estimate prices.

1. Schedule and road user costs.
2. Traffic control.
3. Construction conflicts.
4. Competition of Contractors. Provide the best guess for competition based upon similar projects, how desirable the project may be for contractors, and the remoteness of the project. See [FDM 19-5-5.3](#) for additional information about competition.
5. Other considerations.

## 6.6 Item Level Documentation

The amount of documentation required for any one individual item will vary on the importance of that item to the overall total project cost. It documents what factors were considered when selecting the price and answering the question "why" a price was chosen.

Significant items require the most documentation. Significant items have the greatest influence on estimate accuracy; therefore, it is recommended that more time and effort be focused on determining the unit cost for these items using multiple sources. For all other items, the level of effort and documentation required should be relative to their importance to the overall project cost.

Complete item level documentation as the estimate is being developed. It documents what factors were considered when selecting the price and answering the question "why" a price was chosen.

An example of the Item Level Documentation is in the [estimate documentation guidance document](#).

Use the recommended table to list the significant items including total proposal quantity and percent of total proposal contract value for each significant item. Provide Item Level Documentation for each significant item and summary for non-significant items.

1. Significant items list and item level documentation. **Significant items make up 80% of the project costs; or the top 20% of items whichever comes first.** Provide methodology used to estimate these items. Item level documentation may be an attachment to the estimate documentation template such as the Estimator notes section, an added column to the Q2P main Bid Item worksheet (for WisDOT staff only), an added column to a custom project spread sheet, or a Word document. If the significant item documentation is within an attachment, provide a list of significant items, and state the

attachment that contains the documentation. It is recommended that more time and effort be focused on determining the unit cost for these items and use multiple sources.

2. Non-Significant items summary. Summarize the methodology used to estimate non-significant items. Item Level Documentation is not required for non-significant items where the prices were determined in Estimator and it fits the regression curve between the 25% and 75% quartiles. Prices outside of the 25% and 75% quartiles should be verified with another source. Include this summary in the attachments.

## 6.7 Attachments

Attachments may be referenced throughout the Estimate Documentation. Select the attachments that have been included in the Estimate Documentation. Other attachments may include Non-Significant items summary, Bid Express printouts of significant items, cost-based estimate worksheets, or review comments referenced in [FDM 19-5-7.1](#) and [FDM 19-5-7.2](#).

## FDM 19-5-7 Construction Estimate Review

May 17, 2021

Estimate accuracy increases if significant item unit prices have been updated prior to plan submittal. Reviewing and updating significant item unit prices is critical to ensuring construction estimates are more accurate.

Review how costs have changed since project inception and see if costs are consistent throughout

### 7.1 Independent Review

An independent review of the estimate and its documentation must be completed by the project manager or delegate who did not develop the estimate. This review is in addition to the Program Controls Review. Independent review should be completed throughout the estimate development.

### 7.2 Region Program Controls Review

Estimates will be reviewed by the Region Program Controls Unit or delegate before PS&E.

### 7.3 Post PS&E Review

#### 7.3.1 PS&E to Letting

A cursory review of all estimates will be completed by the Statewide Estimating Engineer. An in-depth review of specific items will be performed based upon current trends.

#### Updating the estimate after PS&E

- Review major bid items to recent lettings when central office plan review comments are received. View the [Recent Estimating Trends](#) document, and update the estimate appropriately. This will be the last time that prices can be adjusted unless an addendum for other design needs is completed. An updated Estimate Documentation Report is not required.
  - Bureau of Project Development would like the construction estimates to be as accurate as possible before the bids are received. If an addendum is already needed, estimate unit prices may be updated for any item, especially for items impacted by the addenda.
  - Regions may adjust structure estimates after PS&E. BOS staff typically do not review their estimates after PS&E and may be contacted if region staff have estimate questions for structure items.
- If the project's estimate changes after PS&E by 10% or \$100,000 contact Regional FIIPS Coordinator to work with Programing Finance staff to update FIIPS. Once the project is sent to FHWA, six to eight weeks prior to the letting date, the estimate and project funding is locked in FIIPS.

#### 7.3.2 Post Letting

Do not contact a contractor that submitted a bid on a proposal during the post letting review process. A contractor's bidding strategies or opinion of the proposal shall not influence the decision to award or reject a proposal. Design teams can reach out to industry, through Bureau of Project Development (BPD) working with contracting associations, for biddability and constructability information. This includes contacting eligible bidders that did not turn in a bid to determine reasons for lack of interest in a proposal. Contact BPD Proposal Management Section Chief if there is a need to outreach to industry to help with a justification response. See [FDM 11-5-1.2](#) for collaboration with industry during the design process.

The designer is required to review the estimate when the estimate and actual bid prices varies from the low bid in the following instances.

- The estimate is higher than the low bid by more than 10%.
  - The estimate is the denominator in justification emails. However, estimate accuracy and FHWA/DOT Stewardship has the low bidder as the denominator, where 50% of the estimates will be within 10%.

- The low bid is higher than the estimate by more than 5%.
  - The estimate is the denominator for the governor's letter explaining why the bid prices are high compared to the estimated costs.
- A bid item is bid differently between bidders that a small change in quantities could change the low bidder. The designer is required to verify that the quantities are accurate for these items.

The Department needs to verify we are receiving the true low bid and awarding contracts to the lowest responsible bidder. When a quantity error is found, an Unbalanced Bid Analysis is completed. The Construction and Materials Manual ([CMM 210.2.1](#)) contains the steps followed when Bureau of Project Development completes an Unbalanced Bid Analysis.

[Justification response guidance](#) is attached to the email from Bureau of Project Development and on the Estimate Development Webpage. This guidance provides expectations and guidance for justification email responses. Then, Bureau of Project Development receives the right amount of information in our decision to recommend awarding a contract.

The review completed by the designer will include analysis of costs and quantities for bid items that are significant to the contract to provide a project specific perspective on the discrepancies between the bid and estimated prices. The bid review process is based upon FHWA's [Guidelines on Preparing Engineer's Estimate, Bid Review and Evaluation](#).

## **FDM 19-5-10 Create Estimate and Proposal**

May 17, 2021

For information on AASHTOWare Project Preconstruction go to the [AASHTOWare Project Webpage](#).

The [AASHTOWare Project Preconstruction Page](#) of the AASHTOWare Project Knowledge Base Site will direct the user to documents that are intended to guide the designer through the process of preparing an estimate, developing a proposal, and submitting it for PS&E. The Bureau of Project Development, Publication Standards/Technology Unit can also be contacted for process and procedure questions.

## **FDM 19-5-20 FHWA Project Authorization Process (Delegated Projects)**

December 20, 2013

### **20.1 Background Information**

Differences in project estimates between Federal Highway Administration's (FHWA's) Fiscal Management Information System (FMIS) and related WisDOT systems have caused problems on delegated projects. One of the more common errors occurs in the FMIS Total Project Cost data element. This cost data is transmitted electronically from WisDOT's Financial Integrated Improvement Programming System (FIIPS), but its original source is AASHTOWare. When FHWA reviews a sample of delegated projects, the FMIS cost estimate at the time that authorization of federal funds was requested and approved does not always match the Engineer's Estimate (AASHTOWare) that was provided.

The following process has been developed to identify and preserve the AASHTOWare estimate that matches FMIS (PS&E estimate or a later estimate that is used at the time of authorization), so it can be provided to FHWA upon request in the event the project is selected for review. For additional information, WisDOT staff can refer to document number 06-10-60 of the Program Management Manual.

### **20.2 Corrective Actions for the Cost Estimate Data**

As mentioned, one of the more common errors occurs in the FMIS Total Project Cost data element. This cost data is transmitted electronically from FIIPS, but its original source is AASHTOWare. When FHWA reviews a sample of delegated projects, the FMIS cost estimate at the time that authorization of federal funds was requested and approved does not always match the Engineer's Estimate (AASHTOWare) that is provided.

The following process has been approved to identify and preserve the AASHTOWare estimate that matches the FMIS project cost (PS&E estimate or a later estimate that is used at the time of authorization), so it can be provided to FHWA upon request in the event the project is selected for review.

For state projects:

- When a AASHTOWare project estimate has been revised after the initial PS&E submittal, either by the plan checkers, Region designers or consultants, a PDF of the updated estimate(s) shall be sent to the Region Project Manager. Region Project Managers are required to keep a copy of all AASHTOWare estimates made between PS&E and award, not just the latest estimate. The estimates shall be stored in the project directory to ensure that they can be accessed by anyone. *Only cost estimate changes after PS&E that exceed \$100,000 or 10%, either up or down, will be made in FIIPS.* The Region Project Manager will inform the Region FIIPS Coordinator of all cost estimate updates after PS&E that exceed this threshold. The Region FIIPS Coordinator must make these updates to the estimate in FIIPS and delegate the project to Central Office for check-in. Note that there is an approximate 3-week lockout of FIIPS while

the project is at FHWA for authorization.

For local projects:

- When an AASHTOWare project estimate has been revised after the initial PS&E submittal, either by plan checkers or the design consultant, a PDF of the updated estimate(s) shall be sent to the Region Project Manager. Region Project Manager are required to keep a copy of all AASHTOWare estimates made between PS&E and award, not only the latest estimate. *The Region Project Manager will inform the Region FIIPS Coordinator of all cost estimate updates after PS&E that exceed the \$100,000 or 10%.* The Region FIIPS Coordinator must make updates to the estimate in FIIPS and delegate the project to Central Office for check-in. Note that there is an approximate 3-week lockout of FIIPS while the project is at FHWA for authorization.
- The Proposal Management Section will use the FHWA Compliance Assessment Program form to help Regions identify documents for review. This summary identifies the Region Project Managers, the exact Engineer's Estimate (FIIPS FHWA 37 Form Estimate) that needs to be provided to FHWA, and the estimate date taken from FIIPS Tracking to help Regions locate the estimate.
- [FDM 19-1 Attachment 1.5](#) provides a timeframe when authorization will be taking place for each letting date (between when the PS&E is submitted to FHWA and the AD Meeting). The Region can check that they have a copy of the cost estimate in the project files that matches FIIPS (FMIS) at that time.