

ESTIMATING GUIDANCE

GENERAL

Objective

All engineers' estimates should be consistent in the way that items are estimated. It is the responsibility of the project designer and/or detailer to identify all items necessary to construct the proposed project. Consistency between project estimates is a high priority and should be submitted to be checked prior to a final estimate being submitted to the Project Manager.

All items should be crossed checked against the Standard Specifications and any additional Supplemental Specifications provided. Each item in the Standard Specifications has a basis of payment and method of measurement that defines how contract items are paid. Note that some items may include additional sub items, labor and supervision that are incidental to the item.

All estimates shall utilize the Engineer's Estimate Workbook for consistency purposes.

The following procedures should be followed when estimating individual items:

1. Hand Calculations (Manual Calculations)

The majority of all items are estimated using hand or manual calculations. Whenever possible, station limits and offsets should be listed for all calculations.

Organization of information needed for each calculation should be considered prior to submitting an estimate to be checked. The checker should not have to search or make assumptions on how an item was estimated, it should be noted with-in the 'individual item calculation sheet' the method used for calculations, if not obvious.

Items that are considered to be an 'undetermined location' item should be noted as such. Rounding of item quantities should be done with care, see 'Rules for Rounding' section at the end of this chapter for additional information

2. Computer/Model Aided Calculations

As the technology we use to design our projects continues to increase and expand, so does the availability to utilize this technology to aide in our quantity calculations. This technology is a great tool to aide in calculating item quantities, but should be used with care.

All calculations should be checked for consistency to MaineDOT procedures for each item. It should be noted in the 'individual item calculation sheet' that a computer/model aided calculation was utilized, with all supporting documentation or reports provided to the checker.

3. Estimate Checking

Every item within an engineer's estimate should be checked by either a peer designer or the Senior Designer for the project. The designer shall provide the checker with the full

Microsoft Excel workbook and all supplemental information needed. The checker should insure all formulas are correct and all references are working properly.

When a discrepancy is found, it should be noted as such and brought to the attention of the designer. The designer should make all attempts possible to resolve the discrepancy and satisfy the checker that the item was estimated properly, given available information.

Engineer's Estimate Guidelines

The designer should follow these procedures in preparing the Engineer's Estimate.

Summary Sheet

All individual item numbers, item descriptions, units and raw estimated quantities are referenced into this Summary Sheet. This sheet is where all rounding of item quantities should be displayed in its own column.

Individual Item Calculation Sheets

Each individual sheet shall have the same 'header' that includes the following information:

- Project WIN and Location
- Item number
- Item description
- Initials of whom did the preliminary calculations and final check
- File and Sheet Numbers
- Date item was estimated

Within each individual item sheet should be all information needed to accurately estimate the given item. Any and all assumptions and undetermined location quantities need to be noted as such.

Pay Item Estimate Description

This section presents the procedures the designer should follow for estimating construction quantities for pay items.

201.11 Clearing - Acres

Clearing shall be estimated for all wooded areas bounded by clearing limit lines. Clearing limit lines may be defined as a line showing the break between a wooded area and a clearing or as a line showing the limit of a wooded area to be cleared.

The estimated quantity of clearing shall be determined by one of the following methods:

- a. average width and length
- b. drafting software

When clearing is less than 0.5 acres, it will be considered incidental to the contract and shall be designated in the General Notes.

201.12 Selective Clearing and Thinning - Acres

Selective Clearing and Thinning shall be estimated for all wooded areas bounded by clearing limit lines.

The estimated quantity of selective clearing and thinning shall be determined by one of the following methods:

- a. average width and length
- b. drafting software

201.23 Removing Single Tree Top Only - Each

This item includes trees greater than or equal to 12" in diameter to be removed as shown on the plans. Trees within clearing limit lines are not considered single trees.

201.24 Removing Stump – Each

This item includes all stumps to be removed as shown on the plans. Remove stump for all single tree removal unless otherwise noted on the plans.

202.08 Removal of Building No. XX - Lump Sum

In general, a group of buildings under one ownership, such as a house, barn, garage, or other structure to be removed shall be estimated as separate bid items, one for each structure.

It should be noted that the standard pay item for removal of buildings includes only that portion of the building above the foundation and does not include filling the foundation cavity or removal of the foundation, when required. The filling or removal of foundations should be estimated under normal earthwork items, unless this work has been specifically included in any special provision written concerning the removal of a particular building.

202.11 Removing Portland Cement Concrete Pavement - Square Yard

The amount of concrete pavement to be removed shall be that amount noted on the plans and cross sections.

202.12 Removing Existing Structural Concrete - Cubic Yard

This item is typically used when a designer wishes to remove portions of foundations, retaining walls, etc. The estimated quantity should be the cubic yards of structural concrete to be removed.

The designer also has the option to use rock excavation.

202.127 Removing of Existing Bituminous Pavement – Lump Sum

The amount of existing bituminous pavement to be removed shall be that amount noted on the plans and cross sections.

202.128 Removing of Existing Concrete Curbs and Sidewalks – Lump Sum

The amount of existing concrete curbs and sidewalks to be removed shall be that amount noted on the plans and cross sections.

202.13 Removing Existing Railings (Retained by Department) – Linear Foot

This item is typically used when the designer wishes to salvage hand rails, ornamental rails, special protective rails, etc., and/or when the removal and disposal of an existing rail will be a costly operation for the Contractor. The estimated quantity is the number of linear feet of rail from outside to outside of end posts measured along the grade and line of the rail.

202.14 Removing Existing Railings (Property of Contractor) – Linear Foot

See 202.13.

202.15 Removing Manhole or Catch Basin – Each

This work shall consist of removing and demolishing existing catch basins, manholes, or end walls as noted on the plans.

202.20 Removing Bituminous Concrete Pavement – Square Yard

This item should be used on full-depth, bituminous concrete pavement removal only.

Use common excavation for removing bituminous pavement over portland cement concrete pavement.

202.202 Removing Pavement Surface - Square Yard

This item should be used on partial-depth, bituminous pavement milling only.

202.203 Pavement Butt Joints - Square Yard

This item shall be estimated per [Standard Detail 202\(01\)](#).

Driveway butt joints shall be used for overlays and pavement rehabilitations and shall be estimated at 18" by the width of the driveway opening.

203.20 Common Excavation - Cubic Yard

The amount of Common Excavation to be estimated for a project shall be the cumulative summary of the following:

See the [Earthwork Summary Guidance](#).

Common Excavation from Cross Sections This item shall consist of all excavation shown on the cross sections. This quantity will be determined by use of the computer or average end area method.

Drives and Entrances This item shall consist of all excavation required to construct drives and entrances.

Removing Existing Roadways (New Alignment) This work shall consist of the excavation required to remove old pavement from designated areas outside the embankment area to prepare these areas for loaming and seeding.

Grubbing in Fill This item shall be estimated per Design Guidance – Grubbing in Fill.

Salvaged Topsoil This item shall consist of that amount of excavation required in embankment areas to salvage topsoil.

Muck Excavation

1. The amount of muck excavation to be estimated shall be the entire amount of muck shown on the cross sections.
2. The muck excavation limit lines and the embankment areas designated for the disposal of waste materials shall be determined as shown in [Standard Detail 203\(01\)](#).

203.21 Rock Excavation - Cubic Yard

1. The amount of "Rock Excavation" estimated for a project shall be the cumulative sum of the applicable items as follows:
 - a. Rock Excavation from Cross Sections: This shall consist of all rock excavation shown on the cross sections and as detailed in the typical sections for removal.
 - b. Boulders: This shall consist of all boulders (exposed or subsurface) requiring removal which have a volume of 2 cubic yards or more. If the quantity of boulders is extensive, an attempt should be made to determine the amount involved, and consider bidding the excavation unclassified.
2. When the volume of rock excavation is less than 1000 yards and is also less than 5 percent of the common excavation volume, the quantity will be shown as a non-bid item and the unit price established as 6 times the common excavation unit price.
3. Pay to the 1 H:4 V backslope.

203.211 Presplitting Rock – Linear Feet

Quantity of holes placed 18 inches apart along the plane of fracture multiplied by the depth of the cut.

203.213 Drilling and Blasting of Solid Rock Subgrade – Square Yard

This item shall be estimated by the square yard as shown on the plans.

203.24 Common Borrow - Cubic Yard

See the Earthwork Summary Guidance to determine the estimated quantity.

203.247 Expanded Shale Lightweight Aggregate – Cubic Yard

This item shall be estimated by the cubic yard as shown on the plans. Additional guidance will be provided by the Geotechnical team.

203.25 Granular Borrow - Cubic Yard

The amount of granular borrow to be estimated for a project shall be the sum of the applicable possible usages of granular borrow. Uses of granular borrow are: to replace muck, for use in low, wet areas, embankment construction near box culverts, maintenance of traffic, culvert bedding, and general embankment construction. Granular borrow shall be estimated by the cubic yard as shown on plans.

See the Earthwork Summary Guidance to determine the estimated quantity.

203.26 Gravel Borrow - Cubic Yard

This item shall be estimated by the cubic yard as shown on the plans.

203.27 Rock Borrow - Cubic Yard

This item shall be estimated by the cubic yard as shown on the plans.

203.35 Crushed Stone 3/4–inch – Cubic Yard

This item shall be estimated by the cubic yard as shown on the plans.

203.4339 Geofoam Lightweight Fill – Cubic Yard

This item shall be estimated by the cubic yard as shown on the plans. Additional guidance will be provided by the Geotechnical team.

204.20 Add Shoulder Aggregate to Existing Shoulder, Plan Quantity – Square Yard

This item shall be estimated by the square yard as shown on the plans.

204.41 Rehabilitation of Existing Shoulder, Plan Quantity - Square Yard

This item shall be estimated by the square yard as shown on the plans.

205.41 Reconstruction of Existing Shoulder, Plan Quantity – Square Yard

This item shall be estimated by the square yard as shown on the plans.

205.51 Widening of Existing Shoulder, Plan Quantity - Square Yard

This item shall be estimated by the square yard as shown on the plans.

206.061 Structural Earth Excavation - Drainage & Minor Structures, Below Grade Cubic Yard

This item shall be estimated by the cubic yard as shown on the plans.

206.07 Structural Rock Excavation - Drainage & Minor Structures - Cubic Yard

This item shall be estimated by the cubic yard as shown on the plans.

When rock is encountered, structural rock excavation-drainage shall be estimated using the same criteria and the same horizontal excavation limits as in structural earth excavation. The depth for measurement will be the actual depth required.

Estimate 12 inches below the bottom of the pipe for culvert pipes and Underdrain Types "B" and "C".

Estimate 6 inches below the bottom of catch basins and manholes.

If the total quantity of structural rock excavation is less than 50 CY, the quantity will be shown within the Earthwork Computation Worksheet and is a non-bid item.

206.092 Structural Rock Excavation – Major Structures – Cubic Yard

This item shall be estimated by the cubic yard as determined by the geotechnical section.

206.14 Special Backfill - Cubic Yard

This item shall be estimated by the cubic yard as shown on the plans.

211.20 Inslope Excavation – Linear Foot

This item shall be estimated by the linear foot as shown on the plans.

211.30 Ditch Excavation – Linear Foot

This item shall be estimated by the linear foot as shown on the plans.

304.10 Aggregate Subbase Course - Gravel - Cubic Yard

Estimated quantities are calculated by cross sectional area.

304.103 Aggregate Subbase Course – Gravel, Truck Measure - Cubic Yard

Estimated quantities are calculated by cubic yard of area and shall only be used for estimates totaling less than 1,250 cubic yards.

304.14 Aggregate Base Course – Type A

Estimated quantities are calculated by cross sectional area.

304.15 Aggregate Base Course – Type B

Estimated quantities are calculated by cross sectional area.

304.16 Aggregate Base Course – Type C

Estimated quantities are calculated by cross sectional area.

307.331 Full Depth Recycled Pavement (Untreated) – Square Yard

This item is estimated using plan square yard.

307.332 Full Depth Recycled Pavement (With Emulsified Asphalt Stabilizer) 5” Depth – Square Yard

This item is estimated using plan square yard by set depth.

307.333 Full Depth Recycled Pavement (With Emulsified Asphalt Stabilizer) 6” Depth – Square Yard

This item is estimated using plan square yard by set depth.

308.36 Full Depth Recycling With Cement – Square Yards

This item is estimated using plan square yard by set depth.

309.35 Full Depth Recycled Pavement with Foamed Asphalt 5 Inch Depth – Square Yard

This item is estimated using plan area or

309.36 Full Depth Recycled Pavement with Foamed Asphalt 6 Inch Depth – Square Yard

This item is estimated using plan area.

310.23 3 inch Plant Mixed Recycled Asphalt Pavement – Square Yard

This item is estimated using plan area.

310.24 4 inch Plant Mixed Recycled Asphalt Pavement – Square Yard

This item is estimated using plan area.

310.25 5 inch Plant Mixed Recycled Asphalt Pavement – Square Yard

This item is estimated using plan area.

310.26 6 inch Plant Mixed Recycled Asphalt Pavement – Square Yard

This item is estimated using plan area.

311.33 3 inch Cold in-Place Recycled Asphalt Pavement – Square Yard

This item is estimated using plan area.

311.34 4 inch Cold in-Place Recycled Asphalt Pavement – Square Yard

This item is estimated using plan area.

311.35 5 inch Cold in-Place Recycled Asphalt Pavement – Square Yard

This item is estimated using plan area.

311.36 Full Depth Concrete Rubblization – Square Yard

This item is estimated using plan area.

312.20 Hot In-Place Recycling – Square Yard

This item is estimated using plan area.

403.102 to 403.214 Hot Mix Asphalt – Ton

Estimated quantities are calculated using area in square yards multiplied by the depth in inches multiplied by 110 (pounds per square yard - inch) divided by 2000. Quantities will be estimated by plan view, field measurements or ARAN output.

$$\text{Ton} = \frac{(\text{area in square yards}) \times (\text{depth in inches}) \times (110 \text{ pounds per square yard - inch})}{2,000}$$

Estimated quantities shall be calculated separately for mainline and shoulders.

On overlay projects, for Item 403.209, estimate a 6-foot taper to match existing paved entrances. For gravel entrances without existing paved aprons, estimate for a paved apron width of 3 feet.

For CPR projects, estimate 500 tons per mile for Item 403.211 shim pavement.

409.15 Bituminous Tack Coat, Applied - Gallon

Estimated quantities are calculated using square yard by application rate.

Typical application rates are as follows:

For milled surfaces use 0.05 gallons per square yard of area.

For normal paved surfaces, use 0.03 gallons per square yard of area.

Bituminous tack coat shall be applied to all milled surfaces, existing pavement surfaces and new pavement surfaces.

410.151 Emulsified Asphalt Seal Coat, Applied – Square Yard

Estimated quantities are calculated using square yard by application rate. See special provision for application rate.

410.161 Cover Coat Material, Sand – Pound

Refer to special provision for application rate.

411.09 Untreated Aggregate Surface Course - Cubic Yard

Estimated quantities are calculated by cubic yard.

411.10 Untreated Aggregate Surface Course, Truck Measure – Cubic Yard

The quantity of these items to be estimated shall be done in the same manner as aggregate base course. Estimated quantities are calculated by cubic yard.

411.12 Crushed Stone Surface – Ton

Estimated quantities are calculated using area in square yards multiplied by the depth in inches multiplied by 105 (pounds per square yard per inch) divided by 2000. Quantities will be estimated by plan view or field measurements.

$$\text{Ton} = \frac{(\text{area in square yards}) \times (\text{depth in inches}) \times (105 \text{ pounds per square yard per inch})}{2,000}$$

424.323, 424.333 and 424.3331, 424.3332 Crack Sealer, Applied – Pound

Use the [Crack Seal Estimate Spreadsheet](#) to estimate volume, and multiply by the appropriate pounds per gallon.

424.37 Crack Repair- Linear Foot

Estimate the total length to be treated.

424.3333 Low Modulus Joint Sealer, Applied – Foot

Estimate the total length to be treated.

424.42 Crack Routing – Linear Foot

Estimate the total length to be treated.

424.38 Crack Repair, Hot Pour Mastic – Pound

Use the [Crack Seal Estimate Spreadsheet](#) to estimate volume, and multiply by 15 pounds per gallon.

429.34 Grid/Fabric Composite Pavement Interlayer – Square Foot

Estimate the area to be covered in square feet.

461.210 and 461.2101 9.5mm HMA – Cyclical Pavement Resurfacing – Ton

Estimate 700 tons per mile for surface pavement. Shim pavement must also be estimated under Item 403.211.

461.13 Light Capital Paving - Ton

Estimate 500 tons per mile paved.

462.30 and 462.301 Ultra-Thin Bonded Wearing Course – Square Yard

Estimate the area to be paved in square yards.

502.21 to 502.565 Structural Concrete - Cubic Yard or Lump Sum

The estimated volume shall be determined by the height, width and depth dimensions on the plans or in the special details. Notes: Bridge Program may be contacted for assistance. Lump Sum items shall include quantity of structural concrete and only used with Project Manager approval.

507.0811 to 507.0961 Railings – Lump Sum

The quantity to be estimated shall be the total amount required as shown on the plans.

508.13 Sheet Waterproofing Membrane – Lump Sum

The quantity shall be the length times the width covered by the waterproofing.

508.14 High Performance Waterproofing Membrane – Lump Sum

The quantity shall be the length times the width covered by the waterproofing.

509.11 to 509.411 Structural Plate Pipes and Pipe Arches - Lump Sum

Each plate pipe or pipe arch shall be listed in Engineer's Estimate.

510.10 to 510.12 Special Detours – Lump Sum

This item is not intended for stage construction or road closure situations.

511.07 Cofferdam – Lump Sum

In general, cofferdams shall be estimated as separate bid items, one for each location

512.081 French Drains – Lump Sum

Estimate length, width, and height as shown on plans.

513.09 Slope Protection Portland Cement Concrete – Square Yard

Estimate the length times width of the area to be protected.

513.22 Crushed Stone Slope Protection – Square Yard

Estimate the length times width of the area to be protected.

514.06 Curing Box for Concrete Cylinders - Each

This item should be considered but not automatically estimated whenever structural concrete is used on a project. The designer should check with the Bridge Program, Fabrication Section to see if the quantity of concrete and tests needed require a curing box.

515.20 to 515.21 Protective Coating for Concrete Surfaces – Square Yard/Lump Sum

Estimate the length times width of area to be coated.

518.50 Repair of Upward Facing Surfaces to Reinforcing Steel < 8" – Square Foot

Estimate the length times width of the area to be repaired.

518.51 Repair of Upward Facing Surfaces below Reinforcing Steel < 8" – Square Foot

Estimate the length times width of the area to be repaired.

518.52 Repair of Upward Facing Surfaces $\geq 8''$ – Cubic Yard

Estimate the length x width x depth of the volume of the area to be repaired.

518.60 Repair of Vertical Surfaces $< 8''$ – Square Foot

Estimate the length times width of the area to be repaired.

518.61 Repair of Vertical Surfaces $\geq 8''$ – Cubic Yard

Estimate the length x width x depth of the volume of the area to be repaired.

518.70 Repair of Overhead Surfaces $< 8''$ – Square Foot

Estimate the length times width of the area to be repaired.

518.71 Repair of Overhead Surfaces $\geq 8''$ – Cubic Yard

Estimate the length x width x depth of the volume of the area to be repaired.

524.30 Temporary Structural Support – Each

This item shall be used for stage construction when sheeting or another structural support is needed to maintain traffic.

525.30 Granite Masonry – Square Foot

Estimate the length times width of the area shown on the plans

526.301 Temporary Concrete Barrier Type I - Lump Sum

Measured by the linear foot per the application.

526.312 Permanent Concrete Barrier Type II – Lump Sum

Measured by the linear foot per the application.

526.321 Permanent Concrete Barrier Type IIIa – Lump Sum

Estimate by the linear foot as shown on the plans.

526.323 Texas Classic Rail – Lump Sum

Estimate by the linear foot as shown on the plans.

526.331 Permanent Concrete Barrier Type IIIb – Lump Sum

Estimate by the linear foot as shown on the plans.

526.34 Permanent Concrete Transition Barrier - Each

Estimate the number of transition barriers as shown on the plans.

527.34 Work Zone Crash Cushions – Unit

Estimate the number of cushions as shown on the plans.

534.70 Precast Structural Concrete Arch – Lump Sum

Estimate the number of concrete arches as shown on the plans.

534.71 Precast Structural Box Culvert – Lump Sum

The number of box culverts shall be estimated as separate bid items, one for each location.

601.211 Gabions, Galvanized and Hand Filled - Cubic Yard

Estimate the length times width times depth of the gabions shown on the plans.

601.221 Gabions, PVC Coated and Hand Filled - Cubic Yard

Estimate the length times width times depth of the gabions shown on the plans.

601.23 Mattresses, Galvanized: - Cubic Yard

Estimate the length times width times depth of the mattresses shown on the plans. Estimate a separate bid item for each location

601.24 Mattresses, PVC Coated: - Cubic Yard

Estimate the length times width times depth of the mattresses shown on the plans. Estimate a separate bid item for each location

602.302 Lightweight Foamed Concrete Fill – Cubic Yards

This item shall be estimated by the cubic yard as shown on the plans. Additional guidance will be provided by the Geotechnical team.

603. Pipe Culverts and Storm Drains – Linear Foot

1. **Culvert Option I.** The usage of this option is intended to be for entrance culverts only. Estimate in increments of 1 foot.
2. **Culvert Option III.** The usage of this option is intended to be for roadway culverts and other drainage structures. Estimate in increments of 1 foot. In closed drainage systems, the actual lengths should be measured to the nearest 1-foot from inside wall to inside wall of catch basins.
4. **Reinforced Concrete.** Estimate in increments of 8 feet, however a maximum of one 4 foot section may be included in the total length.
3. **Elbows, Tees, Wyes.** When elbows, tees, wyes or other special fittings are required in underdrain, or storm drain each fitting shall be included for payment as three additional linear feet of the largest pipe line involved. Refer to drainage sheet for additional information.

603.55 Concrete Pipe Ties – Group

Estimate one group of ties per joint of concrete pipe as required.

603.73 to 603.7472 Remove and Relay Pipe: Linear Foot

The amount of pipe to be estimated to be removed and relayed shall be that amount shown and noted on the plans and cross sections measured by the linear foot. Common excavation should be estimated for the removal of the culvert when the excavation is not covered by other items.

603.75 to 603.82 XX Inch Inlet Grate Unit – Each

The quantity of these items to be estimated for a project shall be the number of the required sizes that are shown and noted on the plans.

604.072 to 604.15, 604.16 to 604.182, 604.242 to 604.262 Manholes and Catch Basins - Each

The number of manholes and catch basins of the applicable types to be estimated for a project shall be determined by the number shown and noted on the plans. One-eighth of a unit will be added for each additional foot over 8 feet measured to the nearest foot.

Pay item 604.182 provides only for the cleaning of existing catch basins and manholes that will not be altered, adjusted or rebuilt. Payment for cleaning altered, adjusted or rebuilt catch basins is incidental to each respective pay item.

604.19 to 604.22 XX Inch Trap - Each

The quantity of these items to be estimated for a project shall be the number of the required sizes that are shown and noted on the plans.

604.23 Step - Each

The quantity of steps to be estimated for a project shall be the number that is noted on the plans to be installed in the specified catch basins or manholes.

605.09 to 605.18 Underdrain – Linear Foot

The quantity of underdrain to be estimated for a project shall be that amount shown and noted on plans. When elbows, tees, wyes or other special fittings are required in underdrain, each fitting shall be included for payment as three additional feet of the largest pipe line involved.

606.1301 to 606.1304, 606.15 to 606.17, 606.178 to 606.242, 606.358 to 606.366, 606.55 to 606.65, 606.71 to 606.74 Guardrail – Linear Foot

The amount of guardrail of the above types to be estimated for a project shall be that amount shown and noted on the plans and sections. Straight rail sections shall be estimated in increments of 12.5 feet.

606.1305 to 606.1308, 606.1721 to 606.1732, 606.25 to 606.356, 606.367 to 606.51, 606.66 to 606.70, 606.753 to 606.79 Guardrail – Each

Estimated quantity for these items shall be as noted on cross sections or construction notes and will be paid for by the each

607.08 to 607.11, 607.16 to 607.22, 607.24 to 607.25 Fences – Linear Foot

The estimated quantity for these items shall be as shown on the plans.

607.12 to 607.15, 607.23, 607.30 to 607.35 Fences – Each

The estimated quantity for these items shall be as shown on the plans.

608.07 to 608.16, 608.45, 608.46 Sidewalk - Square Yard

The width and length shall be noted on the plans and used to estimate square yards of each item. All necessary excavation and aggregate base material should be estimated under the applicable item.

608.26 Curb Ramp Detectable Warning Field – Square Foot

Estimate the length times width of the area shown on the plans

609.11 to 609.151, 609.31 to 609.40 Curb - Linear Foot

The quantity of curb of the applicable types to be estimated is the amount shown and noted on the plans.

Vertical Curb Type 1 placed on a radius of 60 feet or less, will be paid for as Vertical Curb Type 1 - Circular. Curb Type 5, placed on a radius of 30 feet or less, will be paid for as Curb Type 5 - Circular.

609.21 Concrete Slipform Curb – Linear Foot

The quantity of curb to be estimated is the amount shown and noted on the plans.

609.214 Concrete Slipform Curb – 4' Terminal End - Each

The quantity of terminal curb will be measured by the each as shown and noted on the plans or construction notes.

609.218 Concrete Slipform Curb – 8' Terminal End - Each

The quantity of terminal curb will be measured by the each as shown and noted on the plans or construction notes.

609.23 to 609.26 Curb - Each

The quantity of terminal curb of the applicable item will be measured by the each as shown and noted on the plans or construction notes.

609.38, 609.39 and 609.40 Resetting Curb – Linear Foot

These items include the quantity of removing and resetting existing curb of the type shown on the plans.

610.07 to 610.18 – Stone and Riprap – Cubic Yard

The estimated quantity of stone and riprap shall be length times width times depth in cubic yards of the appropriate protection specified on the plans.

612.06 Bituminous Sealing Black – Square Yard

The amount to be estimated will be measured in length times width in square yards of area to be sealed.

613.319 Temporary Erosion Control Blanket - Square Yard

The amount to be estimated will be by the square yard, based on length times the width of area to be covered.

614.30 Geocell Confinement System for Slope Protection – Square Foot

The amount to be estimated will be the length times the width of area to be protected.

615.07 Loam - Cubic Yard

The amount of loam to be estimated for a project shall be that amount specified on the plans in cubic yards.

615.10 Dirty Borrow - Cubic Yard

The amount of dirty borrow to be estimated for a project shall be that amount specified on the plans in cubic yards.

616.08 Sodding – Square Yard

The amount of sodding to be estimated for a project shall be that amount specified on the plans in square yards.

618.13 Seeding, Method Number 1 - Unit

This item will be used on all disturbed lawn areas or as shown on the plans. Estimate one unit for each 1000 square feet.

618.14 Seeding, Method Number 2 - Unit

This item will be used on all non-lawn disturbed areas or as shown on the plans. Estimate one unit for each 1000 square feet.

618.15 Temporary Seeding - Pound

This item will be used on all areas shown on the plans. Estimate 3 pounds per 1000 square feet.

618.25 Applied Water – Gallon

Estimate 45 gal/unit for 10% of the Seeding No. 1 and No. 2 Methods. If calculated quantity is less than 500 gallons, do not include item in contract. If calculated quantity is greater than 500 gallons, round up to the Engineer's Estimate minimum quantity of 1000 gallons.

619.12 Mulch - Unit

Mulch is used on all areas seeded by Methods No. 1 and No. 2. Mulch for seeding pits and temporary seeding should also be estimated. Estimate one unit for each 1000 square feet.

619.13 Bark Mulch – Cubic Yard

Bark mulch is used on all areas shown on the plans measured in cubic yards.

619.14 Erosion Control Mix – Cubic Yard

Erosion Control Mix is used on all areas shown on the plans measured in cubic yards

620.54 to 620.61 Geotextiles – Square Yard

These items shall be estimated by length times width or area to be covered as shown on the plans.

621.XX Landscaping - Each

The quantity to be estimated shall be that amount of the respective items noted on the plans or as indicated in Special Provision 621 provided by the Landscape Architect.

622.10 Transplanting Shrub - Each

This item shall be estimated as the number of shrubs to be transplanted as shown on the plans.

622.11 Transplanting Tree - Each

This item shall be estimated as the number of trees to be transplanted as shown on the plans.

625.081 to 625.145 Water Service Supply Lines - Linear Foot

These items are used separately or in combination to replace, sleeve, repair or provide new water service lines when estimated by a participating utility or as shown on the plans.

626.11, 626.31 to 626.33, 626.35 to 626.38 Foundations, Conduit & Junction Boxes for Highway Signing, Lighting, and Signals - Each

These items are estimated as noted on the plans by the each.

626.21 to 626.23 Foundations, Conduit & Junction Boxes for Highway Signing, Lighting, and Signals – Linear Foot

These items are estimated as noted on the plans by the linear foot.

626.332 to 626.333 Foundations, Conduit & Junction Boxes for Highway Signing, Lighting, and Signals – Cubic Yard

These items are estimated as noted on the plans by the cubic yard.

627.18, 627.4071, 627.711 to 627.744, 627.78 Pavement Markings – Linear Foot

These items shall be estimated for each anticipated application as shown on plans by the linear foot.

627.407, 627.75, 627.77 Pavement Markings – Square Foot

These items shall be estimated for each anticipated application as shown on plans by the square foot.

629.05 Labor - Straight Time - Hour

The estimated quantity for this item will be determined on a project-by-project basis by the Project Team.

631.10 to 631.36 Equipment Rental - Hour

The estimated quantity for these items will be determined on a project-by-project basis by the Project Team.

631.175 Contractor Trucking – Ton

This item is used for Contractor trucking for light capital paving only.

634.160 Highway Lighting – Lump Sum

This item will include all labor and materials necessary to install Highway Lighting for one lump sum based on each lighting system as shown on the plans.

634.164 to 634.210 Highway Lighting – Each

These items will include all labor and materials necessary to install Highway Lighting for each lighting device as shown on the plans.

637.07 Sprinkling – 1,000 Gallon

If recommended by the Project Team, sprinkling water for dust control will be measured by the 1,000 gallons.

637.08 Calcium Chloride – Ton

If recommended by the Project Team, calcium chloride for dust control will be measured by the ton.

637.071 Dust Control – Lump Sum

If recommended by the Project Team, this item intended to provide dust control for the entire project.

639.18 to 639.20 Field Office, Each

These items to be estimated for use as recommended by the Project Team.

642.12 Wooden Steps – Each

This item shall be estimated per each set as shown on the plans.

642.15 Precast Concrete Steps – Each

This item shall be estimated per each set as shown on the plans.

642.17 Cast-in-place Concrete Steps - Cubic Yard

This item shall be estimated per cubic yard per set of steps as shown on the plans.

643.60 to 643.83, 643.90 Traffic Signals – Lump Sum

This item will include all labor and materials necessary to install Traffic Signals for one lump sum based on each traffic signal system as shown on the plans.

643.86, 643.91 to 643.94 Loop Detector and Poles – Each

These items will include all labor and materials necessary to install loop detectors and/or poles for each component as shown on the plans.

645.103 to 645.118, 645.161, 645.162, 645.281 to 645.286, 645.301 and 645.302 Highway Signing – Each

These items shall be estimated per each as shown on the plans.

645.12 to 645.15 and 645.305 Highway Signing – Lump Sum

These items will include all labor and materials necessary to install Highway Signing for each item as shown on the plans.

645.251 to 645.271, 645.291 and 645.292 Highway Signing – Square Foot

These items will include all labor and materials necessary to install Highway Signing per square foot of sign as shown on the plans.

645.289 Highway Signing Steel H-Beam Poles – Pounds

This item will include all labor and materials necessary to install Steel H-Beam Poles for each pole as shown on the plans.

652.30 to 652.34, 652.41 Maintenance of Traffic – Each

These items shall be estimated per each item. Quantities will be determined by the Project Team.

652.35 Construction Signs – Square Foot

This item shall be estimated per the square foot. Quantities will be determined by the Project Team.

652.36 Maintenance of Traffic Control Devices – Calendar Day

This item shall be estimated per the calendar day. Duration will be determined by the Project Team based on anticipated construction schedule.

652.38 Flaggers – Hour

The estimated quantity for this item will be determined on a project-by-project basis by the Project Team.

652.381 Traffic Control Officers – Hour

The estimated quantity for this item will be determined on a project-by-project basis by the Project Team.

652.41 Portable-Changeable Message Sign – Each

The estimated quantity for this item will be determined on a project-by-project basis by the Project Team.

653.20 to 652.23 Polystyrene Plastic Insulation - Square Yard

The quantity to be estimated shall be that amount shown on the plans or referenced in the contract documents.

656.75 Temporary Soil Erosion and Water Pollution Control – Lump Sum

This item shall be estimated when determined by the Project Team.

658.20 Acrylic Latex Color Finish - Square Yard

The amount to be estimated shall be the number of square yards of area to be treated.

659.10 Mobilization - Lump Sum

This item shall be estimated for all projects when a Contractor is expected to move equipment onto a project.

660.22 On-The-Job Training – Hour

This item will be used on projects based on labor costs as directed by the Civil Rights Office.

672.10 Precast Concrete Block Gravity Wall – Square Foot

This item will be measured by the square foot of wall face as shown on the plans.

673.10 Wet Cast Small Landscape Block Wall – Square Foot

This item will be measured by the square foot of wall face as shown on the plans.

674.10 Prefabricated Concrete Modular Gravity Wall – Square Foot

This item will be measured by the square foot of wall face as shown on the plans.

676.00 Soldier Pile and Lagging Wall – Square Foot

This item shall be estimated by the square foot of wall face (including any lagging panel below finished grade) as shown on the plans. Additional guidance will be provided by the Geotechnical team.

677.20 Mechanically Stabilized Earth Retaining Wall – Square Foot

This item will be measured by the square foot of wall face as shown on the plans.

681.10 Precast Aggregate-Filled Concrete Block Gravity Wall – Square Foot

This item will be measured by the square foot of wall face as shown on the plans.

RULES FOR ROUNDING

This section presents rounding and adjustment factors which apply to estimating construction quantities.

1. **Types.** There are two types of quantities:
 - a. Quantities from Counting: Examples include trees, single posts, etc.
 - b. Quantities from Calculations: Examples include excavation, Portland cement concrete, loam, etc.
2. **Counted Items.** The estimated quantity shall be the actual total count as taken from the plans.
3. **Calculated Quantities.** The following rules shall apply (excluding drainage items):
 - a. Total quantities less than 1.0 shall be rounded upward to 1.0.
 - b. Total quantities of 1 but less than 10 shall be rounded upward to the nearest whole number.
 - c. Total quantities of 10 but less than 100 shall be rounded upward not more than 1 unit.
 - d. Total quantities of 100 but less than 1,000 shall be rounded upward not more than 10 units.
 - e. Total quantities of 1,000 but less than 10,000 shall be rounded upward not more than 50 units.
 - f. Total quantities of 10,000 or more shall be rounded upward to the nearest third significant figure.