

**DOCUMENTATION AND METHOD OF MEASUREMENT**  
**5-591.420 CONTRACT ADMINISTRATION MANUAL**

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Special Pay Items

Special pay items, not specifically covered by the Standard Specifications, shall be measured and documented in accordance with the method of measurement and basis of payment outlined in the Contract Special Provisions. If a special pay item is not addressed in the Contract Special Provisions, or in this section 420 of the Contract Administration Manual, measurement and payment shall be made in accordance with the Standard Specifications as applied to a similar or "like" pay item.

Special pay items are listed in the Contract Special Provisions using a .600 suffix after the 4 digits item number. [Example: Item 2506.603 - L.P. Catch Basin Design Special]

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Spec. No.: 2021  
Contract Items: Mobilization

Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Enter on I.R.A. as a decimal for the Partial Estimate. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump Sum - Engineer will estimate the dollar value percentage of the completed work for the Partial Estimate. See Standard Specifications for Construction.

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Spec. No.: 2031  
Contract Items: Field Office, Type \_\_\_\_\_  
Field Laboratory, Type \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record on the I.R.A. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Unit - Payment based on number of satisfactory accepted units.

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Spec. No.: 2051  
Contract Items: Maintenance & Restoration of Haul Roads

Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record in remarks column on the I.R.A. the date the haul road was released. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump Sum - One hundred percent (100%) of this item paid upon satisfactory restoration.

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Spec. No.: 2101  
Contract Items: Clearing and Grubbing

Unit - U.S.: Acre  
Unit - Metric: (*Hectare*)

Documentation: Record topographic notes. For the Final, submit the topographic notes with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute the horizontal area bounded by lines 10 feet, (3 m) outside the line of trunks of trees cleared, or stumps grubbed. Compute each area to the closest 0.05 acre, (0.02 ha).

.....

Spec. No.: 2101 (cont.)  
Contract Items: Clearing and Grubbing

Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record on the I.R.A. as a decimal for Partial Estimate. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump Sum - Pay the percent completed in each Partial Estimate. Pay 100% of each item on the satisfactory completion of all clearing and grubbing.

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Spec. No.: 2101 (cont)  
Contract Items: Clearing  
Grubbing

Unit - U.S.: Tree  
Unit - Metric: Tree

Documentation: Record tree count for each item, in each area as part of the notes. For the final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Count for payment all trees more than 4", (100 mm) in diameter at a point 2 feet, (600 mm) above ground, or at cutoff point for stumps.

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Spec. No.: 2102  
Contract Items: Pavement Marking Removal  
Pavement Marking Removal – Temporary  
Pavement Marking Removal - Permanent

Unit - U.S.: S.F  
Unit - Metric: (*Square Meter*)

Documentation: Record location, dimensions and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute the area of the markings as Acceptably Removed. Striping areas will computed on the basis of nominal widths and actual lengths as originally applied and still evidenced at the time of removal.

.....  
Spec. No.: 2102 (cont.)  
Contract Items: Pavement Marking Removal  
Pavement Marking Removal – Temporary  
Pavement Marking Removal - Permanent

Unit - U.S.: L.F.  
Unit - Metric: (*Meter*)

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Documentation: Record location and measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Feet, (meter) - Measure length of the original markings as acceptable removed. Removal length will be computed by the actual length of each pavement marking removed and will not include the gap between the broken lines.

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Spec. No.: 2103  
Contract Items: Building Removal

Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record on the I.R.A. For the Final, submit as Source Documentation.

Method of Measurement: Lump Sum - All buildings, on the project, removed will comprise Lump Sum.

.....  
Spec. No.: 2103 (cont.)  
Contract Items: Disconnect Sewer Service  
Disconnect Water Service

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on I.R.A.

Method of Measurement: Unit - Physical count.

.....  
Spec. No.: 2103 (cont.)  
Contract Items: Basement Fill

Unit - U.S.: C.Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record inside dimensions and computations. Record date of backfill as part of the notes. For the Final, submit these records with proper reference on the I.R.A.

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Method of Measurement: Volumetric Measure (By Computation) - Measure and compute fill as volume of air space inside the basement walls below the ground level.

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Spec. No.: 2104  
Contract Items: Remove  
Salvage

Unit - U.S.: L.F.  
Unit - Metric: (*Meter*)

Documentation: Record location and length of each removal and/or salvage. Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Feet (*meter*)- Length measurements will be made along the longitudinal center line of the structure, parallel to the base or foundation upon which the structure is placed, and from end to end of the structure as removed. Pipe measurements will be made from center to center of junction fittings, catch basins, or manholes, and will include the length of any aprons required to be removed in conjunction therewith.

*Note:* Specify Item Name, such as: culvert pipe, sewer pipe, drainpipe, curb and gutter, curb, sidewalk, fence, concrete or masonry structures, railway track, manholes or catch basins, integrant curb, concrete pavement, bituminous pavement, pavement, trench pavement, guard rail, water well, etc.

.....  
Spec. No.: 2104 (cont.)  
Contract Items: Remove  
  
Unit - U.S.: S.F. /S.Y.  
Unit - Metric: (*Square Meter*)

Documentation: Record location, dimensions and computations. For the Final, submit these records with proper reference on the I.R.A.

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Method of Measurement: Area Computation - Measure and compute the in-place area. Removal includes base and cushion courses if applicable. Also includes the removal of integrant curb, if applicable.

*Note: Specify Item Name, such as: culvert pipe, sewer pipe, drainpipe, curb and gutter, curb, sidewalk, fence, concrete or masonry structures, railway track, manholes or catch basins, integrant curb, concrete pavement, bituminous pavement, pavement, trench pavement, guard rail, water well, etc.*

.....  
Spec. No.: 2104 (cont.)

Contract Items: Remove

Unit - U.S.: C.Y.

Unit - Metric: (Cubic Meter)

Documentation: Record three dimensional sketches, measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Measure length, width and depth, and compute volume.

*Note: Specify Item Name, such as: culvert pipe, sewer pipe, drainpipe, curb and gutter, curb, sidewalk, fence, concrete or masonry structures, railway track, manholes or catch basins, integrant curb, concrete pavement, bituminous pavement, pavement, trench pavement, guard rail, water well, etc.*

.....  
Spec. No.: 2104 (cont.)

Contract Items: Remove  
Salvage  
Abandon

Unit - U.S.: Each

Unit - Metric: Each

Documentation: Record location of each removal and/or salvage. For the Final, submit these records with proper reference on the I.R.A.

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Method of Measurement: Unit - Physical count.

*Note:* Specify Item Name, such as: culvert pipe, sewer pipe, drainpipe, curb and gutter, curb, sidewalk, fence, concrete or masonry structures, railway track manholes or catch basins, integrant curb, concrete pavement, bituminous pavement, pavement, trench pavement, guard rail, water well, etc.

.....

Spec. No.: 2104 (cont.)  
Contract Items: Sawing Concrete Pavement  
Sawing Bituminous Pavement

Unit - U.S.: L.F  
Unit - Metric: (Meter)

Documentation: Record location and measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Feet, (meter) - Measure length along the saw cut line(s) as staked by the Engineer.

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Spec. No.: 2105  
Contract Items: Common Excavation  
Sub-grade Excavation  
Unclassified Excavation  
Common Channel Excavation  
Rock Excavation  
Rock Channel Excavation  
Muck Excavation

Unit - U.S.:  
Unit - Metric: (Cubic Meter)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

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Spec. No.: 2105 (cont.)  
Contract Items: Common Excavation  
Unclassified Excavation

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### Common Channel Excavation

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record x-section notes in x-section book. Plot area and show computations on x-section rolls. For the Final, submit the x-section book and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross Section Measure (Re-measurement) - Volume will be computed by the average-end-area method, using the latest available x-section as the original x-sections.

When Common Channel Excavation is Not a Bid Item - Excavation ordered and performed that would otherwise be classified as Common Channel Excavation will be paid for separately at the Contract price for Common Excavation in the body plus \$1.00 additional per C.Y., (\$1.30 additional per m3) as a back sheet item.

. . . . .  
Spec. No.: 2105 (cont.)  
Contract Items: Rock Excavation

Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit the x-section book and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross Section Measure (Re-Measurement) - Use "the rock when stripped" elevations as the original x-sections.

Over-break Allowance - Compute volume using a 6-inch (6"), (150 mm) over-break allowance outside the grading section as staked, with the exception that 20 inches (20"), (500 mm) (measured horizontally) will be allowed outside of back-slopes in hard rock types where



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pre-splitting is not required. No over-break allowance will be made for pre-split back-slopes.

When Rock Excavation and Rock Channel Excavation are not bid Items - If the Proposal fails to include a bid item for rock excavation or rock channel excavation, and material is uncovered that is so classified, excavation of the rock will be paid for separately at the Contract price for common Excavation or common channel excavation, plus \$12.00 additional per cubic yard, (\$16.00 *additional per M 3*) as a back-sheet item. If no bid item is provided for common channel excavation, excavation of materials classified as rock channel excavation will be paid for at the Contract price for common excavation plus \$13.50 additional per cubic yard, (\$18.00 *additional per m3*) as a back-sheet item. Such stipulated prices for rock excavation will apply up to a maximum of 250 cubic yards, (200 m3) of excavation per item or to such quantity as may be performed by mutual consent prior to execution of a Supplemental Agreement.

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Spec. No.: 2105 (cont.)  
Contract Items: Muck Excavation

Unit - U.S.: C.Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record x-section notes in x-section book. (If borings have been taken after backfill is in-place - in lieu of x-sections - record the boring results in the x-section book.) Plot areas and show volume computations on x-section's rolls. For the Final, submit the x-section book (with borings notes, if necessary) and x-section rolls - with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross-Section Measure (Re-measurement) - When additional Muck Excavation, as required by the Engineer, is removed from below a plane parallel to, and 15 feet (5.0 m) below the natural ground surface, the additional Muck Excavation will be measured in

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5-foot (2.0 m) depth-zone increments and will be paid for, separately as a back-sheet item, as follows:

15'- 20' depth-zone: Contract Bid price + \$0.15/C. Y.

20'- 25' depth-zone: Contract Bid price + \$0.20/C.Y.

25'- 30' depth-zone: Contract Bid price + \$0.25/C.Y.

5.0 - 7.0 m depth-zone: Contract Bid price + \$0.20/m<sup>3</sup>

9.0 m depth-zone: Contract Bid price + \$0.25/m<sup>3</sup>

9.0 - 11.0 m depth-zone: Contract Bid price + \$0.30/m<sup>3</sup>

(i.e., each 2.0 in increment in depth, etc., below 11 m deep, will increase the adjusted unit price by \$0.05)

.....  
Spec. No.: 2105 (cont.)

Contract Items: Rock Excavation

Unit - U.S.: C.Y.

Unit - Metric: (Cubic Meter)

Documentation: Record measurements and volume computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Measure and compute as instructed by the Engineer all boulders and detached stones, having a volume of 1 C.Y. (0.75 m<sup>3</sup>) or more.

.....  
Spec No.: 2105 (cont.)

Contract Items: Granular Borrow (EV)  
Select Granular Borrow (EV)  
Common Borrow (EV)  
Topsoil Borrow (EV)  
Select Topsoil Borrow (EV)

Unit - U.S.: C.Y.

Unit - Metric: (Cubic Meter)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit x-section books and rolls with proper

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reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross-Sectional Measure (EV - Excavated Volume) – Compute volume using the average-end area method, of the material in its original position at the source of supply.

.....

Spec. No.: 2105 (cont.)  
Contract Items: Granular Borrow (LV)  
Select Granular Borrow (LV)  
Common Borrow (LV)  
Topsoil Borrow (LV)  
Select Topsoil Borrow (LV)  
Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material used on Form 28226. For the Final, submit the above forms in booklet or folder form, with proper reference on the I.R.A. See Vehicular Measure Note.

Method of Measurement: Vehicular Measure (LV - Loose Volume) - Measure and compute the capacity of the hauling vehicle to the closest C.Y. (0.1 m<sup>3</sup>) Round the total for each area to the closest C.Y. (m<sup>3</sup>) per day.

.....

Spec. No.: 2105 (cont.)  
Contract Items: Granular Borrow (CV)  
Select Granular Borrow (CV)  
Common Borrow (CV)  
Topsoil Borrow (CV)  
Select Topsoil Borrow (CV)  
Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit the x-section books and rolls with

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proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross-Section Measure (CV - Compacted Volume) –  
Compacted volume will be determined by cross-section measure of the material as placed in the work based on the required placement dimensions, as shown in the Plans, described in the Specifications, or designated by the Engineer.

. . . . .  
Spec. No.: 2105 (cont.)  
Contract Items: Granular Borrow (SV)  
Select Granular Borrow (SV)  
Common Borrow (SV)  
Topsoil Borrow (SV)  
Select Topsoil Borrow (SV)

Unit - U.S.: C. Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit x-section books and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross-Section Measure (S.V. - Stockpile Volume) –  
Compute volume using the average-end area method of the material in the stockpiled position. The Contractor shall shape the stockpile to a condition as directed by the Engineer prior to measurement.

. . . . .  
Spec. No.: 2105 (cont.)  
Contract Items: Stabilizing Aggregate

Unit - U.S.: Ton  
Unit - Metric: (Metric Ton)

Documentation: Record uniform loads on Form 28226. Record non-uniform loads on Form 2177 with tape, slip or other accumulation, showing total for each area per day. For the Final, submit these forms in booklet, folder or packet

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form, with proper reference on the I.R.A. See Delivery Tickets Note. See Uniform Load note – section .410.

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scales. Round each load to closest 0.1 ton (*0.1 metric ton*). Round the total for each area to closest ton (*metric ton*) per day. For uniform load method Delivery Tickets are not required.

.....  
Spec. No.: 2105 (cont.)  
Contract Items: Stabilizing Aggregate

Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material used on Form 28226. For the Final, submit these forms in booklet or folder form, with proper reference on the I.R.A. See Vehicular Measure Note.

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y. (0.1 m<sup>3</sup>) Round the total for each area to the closest C.Y. (M) per day.

.....  
Spec. No.: 2105 (cont.)  
Contract Items: Salvage Aggregate  
Salvage Topsoil  
Salvage Aggregate (LV)  
Salvage Topsoil (LV)

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material used on Form 28226. For the Final, submit these forms in booklet or folder form, with proper reference on the I.R.A. See Vehicular Measure Note.

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y. (0.1 m<sup>3</sup>) Round the total for each area to the closest C.Y. (m<sup>3</sup>) per day.

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Spec. No.: 2105 (cont.)  
Contract Items: Salvage Aggregate (EV)  
Salvage Topsoil (EV)

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit x-section books and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross-Sectional Measure - Compute the volume, using the average-end-area method, of the material.

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Spec. No.: 2105 (cont.)  
Contract Items: Salvage Aggregate (SV)  
Salvage Topsoil (SV)

Unit -U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit x-section books and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross-Section Measure (SV - Stockpile Volume) – Compute volume using the average-end area method of the material in the stockpiled position. The Contractor shall shape the stockpile to a condition as directed by the Engineer prior to measurement.

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Spec. No.: 2106  
Contract Items: Excavation - Common  
Excavation - Sub-grade  
Excavation – Muck  
Excavation – Rock

Unit - U.S.: Cubic Yard

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Unit - Metric: (Cubic Meter)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

.....  
Spec. No.: 2106 (cont.)  
Contract Items: Excavation - Common  
Excavation - Subgrade

Unit - U.S.: C.Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record x-section notes in x-section book. Plot area and show computations on x-section rolls. For the Final, submit the x-section book and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross Section Measure (Re-measurement) - Volume will be computed by the average-end-area method, using the latest available x-section and the original x-sections.

.....  
Spec. No.: 2106(cont.)  
Contract Items: Excavation - Rock

Unit - U.S.: C. Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit the x-section book and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross Section Measure (Re-Measurement) - Use "the rock when stripped" elevations and the original x-sections.

When Rock Excavation is not a bid Item - If the Proposal fails to include a bid item for rock excavation, and material is uncovered that is so classified, excavation of the rock will be paid for

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separately at the Contract price for Excavation - common plus \$20.00 additional per cubic yard, (\$26.00 *additional per M<sup>3</sup>*) as a back-sheet item. Such stipulated prices for rock excavation will apply up to a maximum of 260 cubic yards, (200 m<sup>3</sup>) of excavation per item or to such quantity as may be performed by mutual consent prior to execution of a Supplemental Agreement.

.....  
Spec. No.: 2106 (cont.)  
Contract Items: Excavation - Muck

Unit - U.S.: C.Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record x-section notes in x-section book. (If borings have been taken after backfill is in-place - in lieu of x-sections - record the boring results in the x-section book.) Plot areas and show volume computations on x-section's rolls. For the Final, submit the x-section book (with borings notes, if necessary) and x-section rolls - with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross-Section Measure (Re-measurement) - When additional Muck Excavation, as required by the Engineer, is removed from below a plane parallel to, and 15 feet (5.0 m) below the natural ground surface, the additional Muck Excavation will be measured in 5-foot (2.0 m) depth-zone increments and will be paid for, separately as a back-sheet item, as follows:

15'- 20' depth-zone: Contract Bid price + \$0.30/C. Y.  
20'- 25' depth-zone: Contract Bid price + \$0.50/C.Y.  
25'- 30' depth-zone: Contract Bid price + \$0.70/C.Y.  
(i.e., each 5 ft increment in depth, etc., below 20 ft deep, will increase the adjusted unit price by \$0.20/CY)

5.0 - 7.0 m depth-zone: Contract Bid price + \$0.39/m<sup>3</sup>  
9.0 m depth-zone: Contract Bid price + \$0.65/m<sup>3</sup>  
9.0 - 11.0 m depth-zone: Contract Bid price + \$0.91/m<sup>3</sup>  
(i.e., each 2.0 m increment in depth, etc., below 11 m deep, will increase the adjusted unit price by \$0.26/m<sup>3</sup>)



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Spec. No.: 2106 (cont.)

Contract Items: Excavation – Rock

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record measurements and volume computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Measure and compute as instructed by the Engineer all boulders and detached stones, having a volume of 1 C.Y. (0.75 m<sup>3</sup>) or more.

Spec. No.: 2106 (cont.)

Contract Items: Common Embankment (CV)  
Granular Embankment (CV)  
Select Granular Embankment (CV)  
Select Granular Embankment Modified (1)(CV)  
Granular Embankment – Muck (CV)  
Select Granular Embankment – Muck (CV)

(1) Specify basis of percent modification (ie. 5%, 7%, 10%, etc.)

Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit the x-section books and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross-Section Measure (CV - Compacted Volume) – Compacted volume will be determined by cross-section measure of the material as placed in the work based on the required placement dimensions, as shown in the Plans, described in the Specifications, or designated by the Engineer.

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Spec. No.: 2106 (cont.)  
Contract Items: Stabilizing Aggregate

Unit - U.S.: Acre  
Unit - Metric: (*Hectare*)

Documentation: Record dimensions and computations for the accepted areas. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute accepted areas.

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Spec. No.: 2111  
Contract Items: Test Rolling

Unit - U.S.: Road Station  
Unit - Metric: (*Meter*)

Documentation: Record the length and location of the Roadbed tested. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Road Station - Measure length in road stations of 100 feet along the centerline of the roadbed. Measure ramps and loops to the ends of entrance and exit noses. If the Engineer orders testing on any portion of the roadbed to an extent less than the full width specified, the measurement will be in proportion to the width tested.

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Spec. No.: 2112  
Contract Items: Subgrade Preparation

Unit - U.S.: Road Station  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit the measurements, with proper reference on the I.R.A.

Method of Measurement: Road Station - Measure length in road stations of 100 feet, along the centerline of the roadbed. The work on each separate roadbed in the case of divided highways

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will be measured separately. Locations where grading or subgrade excavation (as described in 2105) is required will not be included in the measurements. On ramps and loops, the length will be measured between the ends of the exit and entrance noses, along the centerline of the ramp or loop roadbed.

Spec. No.: 2118  
Contract Items: Aggregate Surfacing, Class \_\_\_\_\_

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material used on Form 28226. For the Final, submit these forms in booklet or folder form, with proper reference on the I.R.A. See Vehicular Measure Note. Section 500

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y. (0.1 m<sup>3</sup>). Round the total for each area to the closest C.Y. (W) per day.

.....

Spec. No.: 2118 (cont.)  
Contract Items: Aggregate Surfacing, Class \_\_\_\_\_

Unit - U.S.: Ton  
Unit - Metric: (*Metric Ton*)

Documentation: Record uniform loads on Form 28226. Record non-uniform loads on Form 2177 with tape, slip or other accumulation showing total for each area per day. For the Final, submit the above forms in booklet, folder or packet form, with proper reference on the I.R.A. See Delivery Tickets Note. See Uniform Load Note - Section .410.

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scales. Round each load to closest 0.1 ton (0.1 *metric ton*). Round the total for each area to the closest ton (*metric ton*) per day. For uniform load method Delivery Tickets are not required.

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Spec. No.: 2120 (Spec year 2000)  
Contract Items: Earth Shoulder Material

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material used on Form 28226. For the Final, submit the above forms in booklet or folder form, with proper reference on the I.R.A. See Vehicular Measure Note.

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y (0.1m<sup>3</sup>). Round the total for each area to the closest C.Y. (m<sup>3</sup>) per day.

---

Spec. No.: 2123  
Contract Items: Common Laborers  
Motor Grader  
\_\_\_ C.Y. (m<sup>3</sup>) Dragline  
\_\_\_ C.Y. (m<sup>3</sup>) Shovel  
\_\_\_ C.Y. (m<sup>3</sup>) Scraper  
Dozer  
\_\_\_ C.Y. (m<sup>3</sup>) Truck  
H.P. (kW) Tractor  
Rotary Tiller  
\_\_\_ C.Y. (m<sup>3</sup>) Front End Loader  
Pneumatic Tired Roller  
Pneumatic Tired Roller (Tractor Drawn)  
Pneumatic Tired Roller (Self-Propelled)  
Tamping Roller  
\_\_\_ Ton (*metric ton*) Steel-Wheeled Roller

Unit - U.S.: Hour  
Unit - Metric: Hour

Documentation: Record equipment and labor hours on Form 2137. For the Final, submit these forms in booklet or folder form, with proper reference on the I.R.A.

Method of Measurement: Miscellaneous - Measure the hours of actual working time and necessary traveling time within the project

---

# DOCUMENTATION AND METHOD OF MEASUREMENT

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limits. Round the time for each item to the closest half-hour per day.

*Note: The only overtime work, which will receive additional compensation, will be that work ordered by the Engineer.*

---

Spec. No.: 2130  
Contract Items: Water

Unit - U.S.: 1000 (M) Gal.  
Unit - Metric: (Cubic Meter)

Documentation: Record on Form 21236. For the Final, submit these forms with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (Liquid- Load-Count Method).

Measure and compute tank capacities to the closest 100 gallons (0.4 m<sup>3</sup>) and count the number of loads used.

Tank Method. If tank has a rated capacity stenciled or placarded use capacity shown on tank, and count the number of loads used.

Meter Method. Use calibrated meter, and modify Form 21236 to show beginning and ending reading. When a municipal meter is used, a certificate from the municipal officer is acceptable.

In the absence of a contract bid for and when water is not included as incidental to another contract pay item, water applied by order or approval of the Engineer, such as for dust control, will be paid for at a unit price of \$11.00 per 1000 gallons (\$3.00 per m<sup>3</sup>).

---

Spec. No.: 2131  
Contract Items: Calcium Chloride, Type \_\_\_\_\_

Unit - U.S.: Ton  
Unit - Metric: (Metric Ton)

Documentation: Bulk Method - Record the mass of the material from the railroad or truck invoices. (Use converted weights, if applicable). For the Final, submit these invoices and records with proper reference on the IR.A.

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Method of Measurement: Weight (Mass) (Scale) - Measured by the net railroad or track invoice. Round total to the closest 0.1 ton (0.1 *metric ton*). Convert to equivalent mass if other than specified analyses is furnished.

.....  
Spec. No.: 2131 (cont.)  
Contract Items: Calcium Chloride, Type\_\_\_\_\_

Unit - U.S.: Ton  
Unit - Metric: (*Metric Ton*)

Documentation: Bag or Drum Method - Record bag or drum count and computations. (Use converted weights, if applicable). For the Final, submit these records and computations with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) - (By Computation) - Count the number of individual containers and multiply by the weight per container. Round total to the closest 0.1 ton (0.1 *metric ton*). Convert to equivalent weights if other than specified analyses is furnished.

.....  
Spec. No.: 2131 (cont.)  
Contract Items: Calcium Chloride Solution

Unit - U.S.: Gal.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record on Form 21236. For the Final, submit these forms with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (Liquid) - Measure each distributor load by Weight, or by Calibrated Meter. Convert to liquid volume at 60° F (15° C) using the Mn/DOT Bituminous Manual correction factors for Asphalt Emulsion. Convert quantity of 35 % solution to equivalent quantity.

---

Spec. No.: 2201  
Contract Items: Concrete Base  
Concrete Base, Standard Width  
Concrete Base, Irregular Width

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---

Base Reinforcement, Type

Unit - U.S.: S. Y.  
Unit - Metric: (*Square Meter*)

Documentation: See Plan Quantity Note Section .410

Method of Measurement: See Plan Quantity Note.

.....  
Spec. No.: 2201 (cont.)  
Contract Items: Structural Concrete

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: See Plan  
Quantity.

Method of Measurement: Engineer will pay for additional cement used in the Structural Concrete as per Specification 2301.5\*. Extra Work Compensation will be provided by the following formula: (Engineer shall have Documentation for total C.Y. (M) of each specific design in the records.)

$$E = \frac{(D - Y) \times C \times I \times 1.15}{2000}$$
$$E = (D - M) \times C \times I \times 1.15 \text{ Metric Equivalent}$$

Note: \*see Standard Specifications for Construction: deletions in 2005.

.....  
Spec. No.: 2201 (cont.)  
Contract Items: Expansion Joints, Design \_\_\_\_\_  
Integral Curb, Design \_\_\_\_\_

Unit - U.S.: L.F.  
Unit - Metric: (*Meter*)

Documentation: Record on Form 28233. For the Final, submit these forms in booklet form with proper reference on the I.R.A.

Method of Measurement: Linear Feet (*meter*) Measure length of work actually performed.

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## CONTRACT ADMINISTRATION MANUAL

---

Spec. No.: 2201 (cont.)  
Contract Items: Dowel Bars

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit records with proper reference on the I.R.A.

Method of Measurement: Dowel Bars - Physical count of the actual number of individual placed. No measurement will be made under this item that are paid for as a part of expansion joint construction.

.....

Spec. No.:  
Contract Items: Reinforcement Bars

Unit - U.S.: Lb.  
Unit - Metric: (*Kilogram*)

Documentation: Record on Form 2215 or 28233. For the Final submit these forms in booklet or folder form with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation) - Compute the mass of reinforcement bars based on the lengths shown in the Plans. The quantity measured will include only those splices, which are shown in the Plans. Use table shown in Specification 2472.4A. Do include bar supports or tie wires.

---

Spec. No.: 2204 (Not in Spec 2005)  
Contract Items: Bituminous Material for Mixture

Unit - U.S.: Gal.  
Unit - Metric: (*Liter*)

Documentation: Record quantity of material used each day on Form 24326. Show method of determining quantity under "Remarks" on first day. For the Final, submit Form 24326 in booklet or folder form with proper reference on I.R.A.



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CONTRACT ADMINISTRATION MANUAL

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Method of Measurement: Volumetric Measure (Liquid) - Measure storage tank content at start of day; add material received; subtract material wasted, hauled off job and remaining at end of day. Convert all bituminous material to liquid volume at 60° F (15° C). (Do not include additional water mixed with asphalt emulsions.)

. . . . .  
Spec. No.: 2204 (cont.)  
Contract Items: Bituminous Mixture, Class \_\_\_\_ Aggregate

Unit - U.S.: Ton  
Unit - Metric: (*Metric Ton*)

Documentation: Record uniform loads on Form 28226. Record non-uniform Form 2177 with tape, slip or other accumulation, showing total for each area per day. For the Final, submit the above forms in booklet, folder or packet form, with proper reference on the I.R.A. See Delivery Tickets Note. See Uniform Load Note - section .410.

Method of Measurement: Weight (*Mass*) (Scale) - Weight on approved scales. Round to closest 0.1 ton (*0.1 metric ton*). Round total for each area to closest ton (*metric ton*) per day. For uniform load method, Delivery Tickets are not required.

---

Spec. No.: 2206 (Not in 2005 Spec Book)  
Contract Items: Soil Cement Base

Unit - U.S.: S. Y.  
Unit - Metric: (*Square Meter*)

Documentation: See Plan Quantity Section .410

Method of Measurement: See Plan Quantity.

. . . . .  
Spec. No.: 2206 (cont.)  
Contract Items: Cement  
Soil  
Sand Cover

Unit - U.S.: Ton

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## CONTRACT ADMINISTRATION MANUAL

---

Unit - Metric: (Metric Ton)

Documentation: Record uniform loads on Form 28226. Record non-uniform Form 2177, with tape, slip or other accumulation showing total for each area per day. For the Final, submit the above in booklet or packet form, with proper reference on the I.R.A. See Delivery Tickets Note. See Uniform Load Note – section .410.

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scales. Round load to closest 0.1 ton (0.1 metric ton). Round total for each area to closest ton (metric ton) per day. For the uniform load method, Tickets are not required.

.....

Spec. No.: 2206 (cont.)  
Contract Items: Soil (LV)  
Sand Cover (LV)

Unit - U.S.: C. Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material used on Form 28226. For the Final, submit the above forms in booklet or folder form, with proper reference on the I.R.A. See Vehicular Measure Note.

Method of Measurement: Vehicular Measures - Measure and compute vehicle capacities to closest 0.1 C.Y. (0.1 m3). Round total for each area to the closest C.Y. (m3) per day.

.....

Spec. No.: 2206 (cont.)  
Contract Items: Bituminous Curing Material

Unit - U.S.: Gal.  
Unit - Metric: (Liter)

Documentation: Record on Form 21841. For the Final, submit these forms in packet form with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (Liquid) - Measure each distributor load by weight, or by calibrated meter. Convert to liquid

# DOCUMENTATION AND METHOD OF MEASUREMENT

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## CONTRACT ADMINISTRATION MANUAL

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volume at 60° F (15° C). (Do not include additional water mixed with asphalt emulsions.)

---

Spec. No.: 2207 (Not in 2005 Spec Book)  
Contract Items: Bituminous Material for Mixture

Unit - U.S.: Gal. / Liter

Documentation: Record on Form 21841. For the Final, submit these forms in packet form with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (Liquid) - Measure each distributor load by sticking, by weight, or by calibrated meter. Convert to liquid volume at 60° F (15° C). (Do not include additional water mixed with asphalt emulsions.)

. . . . .  
Spec. No.: 2207 (cont.)  
Contract Items: Bituminous Stabilized Sub-grade, \_\_\_\_\_(mm)  
Thick

Unit - U.S.: S.Y.  
Unit - Metric: (Square Meter)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity

---

Spec. No.: 2211  
Contract Items: Aggregate Base, Class \_\_\_\_\_  
Stockpile Aggregate, Class \_\_\_\_\_

Unit - U.S.: Ton  
Unit - Metric: (Metric Ton)

Documentation: Record uniform loads on Form 28226. Record non-uniform loads on Form 2177 with tape, slip or other accumulation showing total for each area per day. For the Final, submit the above forms in booklet or packet form, with proper reference on the I.R.A. See Delivery Tickets. See Uniform Load – section .410.

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---

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scales.  
Round each load to closest 0.1 ton (0.1 *metric ton*).  
Round total for each area to closest ton (*metric ton*) per day. For the uniform load method, Tickets are not required.

.....  
Spec. No.: 2211 (cont.)  
Contract Items: Aggregate Base (LV), Class \_\_\_\_\_  
Stockpile Aggregate (LV), Class \_\_\_\_\_

Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurement and volume computations on 2141. Record the load-count of material used on Form 28226. For the Final, submit the above forms in booklet or form with proper reference on the I.R.A. See Vehicular Measure Note section .410.

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y (0.1 *m3*). Round total for each area to the closest C.Y. (*m 3*) per day.

.....  
Spec. No.: 2211 (cont.)  
Contract Items: Aggregate Base (CV), Class \_\_\_\_\_

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

.....  
Spec. No.: 2211 (cont.)  
Contract Items: Stockpile Aggregate (SV), Class \_\_\_\_\_

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record x-sections notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit these records with proper reference on the I.R.A. See Records to be submitted in section .510.

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## CONTRACT ADMINISTRATION MANUAL

---

Method of Measurement: Cross-Section Measure (SV - Stockpile Volume) – Compute volume using the average-end area method of the material in the stockpiled position. The Contractor shall shape the stockpile to a condition as directed by the Engineer prior to measurement.

---

Spec. No.: 2221  
Contract Items: Aggregate Shouldering, Class \_\_\_\_\_  
Stockpile Aggregate, Class \_\_\_\_\_

Unit - U.S.: Ton  
Unit - Metric: (*Metric Ton*)

Documentation: Record uniform loads on Form 28226. Record non-uniform loads on Form 2177 with tape, slip or other accumulation showing total for each area per day. For the Final, submit the above forms in booklet or packet form with proper reference on the I.R.A. See Delivery Tickets. See Uniform Load note in section .410.

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scales. Round to closest 0.1 ton (*0.1 metric ton*). Round total for each area to closest ton (*metric ton*) per day. For the uniform load method, Tickets are not required.

.....  
Spec. No.: 2221 (cont.)  
Contract Items: Aggregate Shouldering (LV), Class \_\_\_\_\_

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material used on Form 28226. For the Final, submit the above forms in booklet or folder form with proper reference on the I.R.A. See Vehicular Measure section .410

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y (0.1 m<sup>3</sup>). Round total for each area to the closest C.Y. (*m<sup>3</sup>*) per day.

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## CONTRACT ADMINISTRATION MANUAL

---

Spec. No.: 2221 (cont.)  
Contract Items: Stockpile Aggregate (LV), Class \_\_\_\_\_

Unit - U.S.: C.Y.  
Unit - Metric: *(Cubic Meter)*

Documentation: Record vehicle measurement and volume computations on Form 2141. Record the load count of material used on Form 28226. For the Final, submit the above forms in booklet or folder form with proper reference on the I.R.A. See Vehicular Measure – Section .410

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y (0.1 m3). Round total for each area to closest C.Y. (M) per day.

.....  
Spec. No.: 2221 (cont.)  
Contract Items: Stockpile Aggregate (SV)

Unit - U.S.: C.Y.  
Unit - Metric: *(Cubic Meter)*

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit the x-section books and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross-Section Measure (SV - Stockpile Volume) - Compute using the average end area method of the material in the stockpiled position. The Contractor shall shape the stockpile to a condition as directed by the Engineer prior to measurement.

.....  
Spec. No.: 2221 (cont.)  
Contract Items: Aggregate Shouldering (CV), Class \_\_\_\_\_

Unit - U.S.: C.Y.  
Unit - Metric: *(Cubic Meter)*

Documentation: See Plan Quantity in Section .410

Method of Measurement: See Plan Quantity.

# DOCUMENTATION AND METHOD OF MEASUREMENT

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## CONTRACT ADMINISTRATION MANUAL

---

Spec. No.: 2231  
Contract Items: Bituminous Patching Mixture

Unit - U.S.: Ton  
Unit - Metric: (*Metric Ton*)

Documentation: Record uniform loads on Form 28226. Record non-uniform on Form 2177, with tape, slip or other accumulation showing total for each area per day. For the Final, submit the above forms in booklet or packet form with proper reference on the I.R.A. See Delivery Tickets. See Uniform Load – section .410.

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scales. Round each load to closest 0.1 ton (0.1 *metric ton*). Round total for each area to closest ton (*metric ton*) per day. For uniform load method, Tickets are not required.

.....  
Spec. No.: 2231 (cont.)  
Contract Items: Bituminous Patching Mixture

Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material used on Form 28226. For the Final, submit these forms in booklet or folder form with proper reference on the I.R.A. See Vehicular Measure in Section .410.

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y (0.1 m<sup>3</sup>). Round total for each area to the closest C.Y. (*m<sup>3</sup>*) per day.

.....  
Spec. No.: 2231 (cont.)  
Contract Items: Mixture for Joints and Cracks

Unit - U.S.: LB.  
Unit - Metric: (Kilogram)

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## CONTRACT ADMINISTRATION MANUAL

---

Documentation: Record uniform loads on Form 28226. Record non-uniform loads on Form 2177, with tape, slip or other accumulation showing total for each area per day. For the Final, submit the above forms in booklet or packet form with proper reference on the I.R.A. See Delivery Tickets. See Uniform Load note - section .410.

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scales. Round each load to closest 10 pounds (5 kg). Round total for each area to closest Lb. per day. For uniform load method, Tickets are not required.

.....

Spec. No.: 2231 (cont.)  
Contract Items: Joint and Crack Filler

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record on Form 28226. For the Final, submit Forms 28226 in booklet form with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation) - Count containers of sealer used and multiply by pounds per container.

---

Spec. No.: 2232  
Contract Items: Mill Bituminous Surface  
Mill Concrete Pavement Surface

Unit - U.S.: S.Y.  
Unit - Metric: (Square Meter)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A

Method of Measurement: Area Computations - Measurements and computations will be those areas milled as specified, based on actual finished dimensions of the work.

---

Spec. No.: 2301



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Contract Items: Concrete Pavement  
Concrete Pavement, Standard Width  
Concrete Pavement, Irregular Width  
Pavement Reinforcement, Type \_\_\_\_\_

Unit - U.S.: SY.  
Unit - Metric: (Square Meter)

Contract Items: Structural Concrete  
Structural Concrete, HE (High Early Strength)

Unit - U.S.: C.Y.  
Unit - Metric: (Cubic Meter)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

Note: *Engineer will pay for additional cement used in the Structural Concrete as per Specification 2301.5. Extra Work Computation will be provided for by the following formula:*

\*\*\*\*\*

2301.5(l) Standard Strength Concrete (Not in Spec 2005)

$E = \frac{(D - M) \times C \times I \times 1.15}{2000}$
--

(E) =Extra pay for additional cement

(D) =Design Cement in pounds/C. Y (From Form 2155)

(M) = Minimum Cement in pounds/C. Y (From 2461.3C or Spec. Provisions)

(C) = C. Y Concrete at specific design excluding waste (Total C. Y. Concrete will not exceed

*the final quantity of the Structural Concrete pay item)*

(I) =Invoice price of cement per ton

$E = (D - M) \times C \times I \times 1.15$  Metric equivalent

$E = (D - M) \times C \times I \times 1.15$  Metric equivalent

(E) = Extra Pay for additional cement

(D) = Design Cement in kilograms/cubic meter (From form 2155)

(M) = Minimum Cement in minimum Cement in kilograms/cubic meter (From 2461.3C or Spec. Provisions)

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(C) = *Cubic Meter Concrete at specific design excluding waste (Total Cubic Meter Concrete will not exceed the final quantity of the Structural Concrete pay item.) Invoice price of cement per kilogram.*

\*\*\*\*\*

2301.5(2) -High Early Strength Concrete furnished and placed at the Contractor's discretion with the Engineer's approval, beyond the Contract requirements and without the Engineer's order. (Not in Spec 2005)

$$E = \frac{(D - M) \times C \times I \times 1.15}{2000}$$

- (E) = *Extra pay for additional cement*
- (D) = *Design Cement in pounds/C. Y (From Form 2155)*
- (M) = *Minimum Cement in pounds/C. Y from 2461.3C or Spec. Provisions as established in the Standard Strength Concrete*
- (C) = *C. Y Concrete at specific design excluding waste (Total C. Y Concrete will not exceed the final quantity of the Structural Concrete pay item.)*
- (I) = *Invoice price of cement per ton*

$$E=(D-M) \times C \times I \times 1.15 \text{ Metric equivalent}$$

- (E) *Extra pay for additional cement*
  - (D) *Design Cement in kilograms/cubic meter (From form 2155)*
  - (M) = *Minimum Cement in kilograms/cubic meter (From 2461.3C or Special Provisions)*
  - (C) = *Cubic Meter Concrete at specific design excluding waste (Total Cubic Meter Concrete will not exceed the final quantity of the Structural Concrete pay item.)*
- 2005 Spec Year – High Early Concrete Mixes – Contractor Requested, Engineer Approved: NO EXTRA COMPENSATION will be provided for high early when requested by the Contractor.

\*\*\*\*\*

2301.5(3) - High Early Strength Concrete furnished as a separate pay item  
(2301.513 Structural Concrete H.E.)

$$E = \frac{(D - M) \times C \times I \times 1.15}{200}$$

- (E) = *Extra pay for additional cement*
- (D) = *Design Cement in pounds/C.Y. (From Form 2155)*

# DOCUMENTATION AND METHOD OF MEASUREMENT

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---

(M) = Minimum from Standard Strength Concrete plus 30%

Example: Standard Minimum (530#) + 30% H.E. (159) = H.E. Minimum (689#)

(C) = C.Y. Concrete at specific design excluding waste (Total C.Y. Concrete will not exceed the final quantity of the Structural Concrete pay item.)

(I) = Invoice price of cement per ton

$$E = (D - M) \times C \times I \times 1.15 \text{ Metric equivalent}$$

(E) Extra, Pay for additional cement

(D) = Design Cement in *kilogram/cubic meter* (From form 2155)

(M) = Minimum from Standard Strength Concrete plus 30%

Example: Standard Minimum (240 kg) + 30% HE. (72 kg) = H.E. Minimum (312 kg)

(C) = *Cubic Meter* Concrete at specific design excluding waste (Total *Cubic Meter*

Concrete will not exceed the final quantity of the Structural Concrete pay item.)

(I) = Invoice price of cement per *kilogram*.

\*\*\*\*\*

2301.5(4) - High Early Strength Concrete ordered by the Engineer without a separate pay item. Extra work is paid for as 20% of Contract Unit Price.

$E = \frac{(D - M) \times C \times I \times 1.15 + 0.02 \times B}{2000}$
--

(E) = Extra pay for additional cement

(D) = Design Cement in pounds/C.Y. (From Form 2155)

(M) Minimum from Standard Strength Concrete plus 30%

Example: Standard Minimum (530#) + 30% H.E. (159) = H.E. Minimum (689#)

(C) C.Y. Concrete at specific design excluding waste (Total C.Y. Concrete will not exceed

the final quantity of the Structural Concrete pay item.)

(I) = Invoice price of cement per ton

(B) = Contract Unit Price per Cubic Yard

$$E = (D - M) \times C \times I \times 1.15 + 0.02 \times B \times C \text{ Metric equivalent}$$

(E) = Extra, Pay for additional cement

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---

(D) = Design Cement in *kilograms/cubic meter* (From form 2155)

(M) = Minimum from Standard Strength Concrete plus 30%

Example: Standard Minimum (240 kg) + 30% H.E. (72 kg) = H.E.

Minimum (312 kg)

(C) *Cubic Meter* Concrete at specific design excluding waste (Total *Cubic Meter* Concrete will not exceed the final quantity of the Structural Concrete pay item.)

(I) = Invoice price of cement per *kilogram*.

(B) = Contract unit Price per *cubic meter*.

Documentation for 2301.5(I) - 2301.5(4) - Reference computations on the I.R.A.

Submit the I.R.A. for Final Pay.

\*\*\*\*\*

### 2301.3M - Extreme Service Membrane Cure

*Will be provided at the rate of \$0.225 per square yard(\$0.25 per square meter) of Concrete Pavement placed requiring this type of cure. Payment will be made as a "Backsheet " item.*

Spec. No.: 2301 (cont.)  
Contract Items: Bridge Approach Panels, Design \_\_\_\_\_

Unit - U.S.: S.Y.  
Unit - Metric: (Square Meter)

Documentation: Record on Form 28233. For the Final, submit these forms in booklet form with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute the area of pavement as constructed.

.....

Spec. No.: 2301 (cont.)  
Contract Items: Bridge Approach Panels\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Measure as a complete in-place item.

.....

Spec. No.: 2301 (cont.)  
Contract Items: Dowel Bar

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Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit records with proper reference on the I.R.A.

Method of Measurement: Unit – Physical count.

. . . . .  
Spec. No.: 2301 (cont.)  
Contract Items: Concrete Coring

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

. . . . .  
Spec. No.: 2301 (cont.)  
Contract Items: Reinforcement Bars (Epoxy Coated)

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record on Form 2215 or 28233. For the Final, submit these forms in booklet or folder form with proper reference on the I. R. A.

Method of Measurement: Weight (Mass) (By Computation) - Compute the mass of reinforcement bars, prior to coating with epoxy, based on the lengths shown in the Plans. The quantity measured will include only those splices that are shown in the Plans. Use table shown in Specification 2472.4A. Do not include bar supports or tie wires.

. . . . .  
Spec. No.: 2301 (cont.)  
Contract Items: Expansion Joints, Design \_\_\_\_\_  
Integrant Curb, Design \_\_\_\_\_

Unit - U. S.: L. F.

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Unit - Metric: (Meter)

Documentation: Record on Form 28233. For the Final, submit these forms in booklet form with proper reference on the I.R.A.

Method of Measurement: Linear Feet (meter) - Measure length of work actually performed.

---

Spec. No.: 2321

Contract Items: Bituminous Material for Mixture

Unit - U.S.: Gal

Unit - Metric: (Liter)

Documentation: Record on Form 21841. For the Final, submit these forms in form with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (Liquid) - Measure each load by sticking, by calibrated meter. Convert to liquid volume at 60° F (15° C). (Do not include additional water mixed with asphalt emulsion.)

*Note: Fog seal material will be measured and included with the Bituminous Material for Mixture.*

.....  
Spec. No.: 2321 (cont.)

Contract Items: Aggregate

Stockpile Stockpile Aggregate, Class \_\_\_\_\_

Unit - U.S.: Ton

Unit - Metric: (Metric Ton)

Documentation: Record uniform loads on Form 28226. Record non-uniform loads on Form 2177. Automatic printout type tickets may be substituted for either of the above two methods. For the Final, submit the above forms in booklet, packet or bundle form, with proper reference on the I.R.A. See Delivery Tickets. See Uniform Load note - section .410.

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scales. Round each load to closest 0.1 ton (0.1 *metric ton*).

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Round total for each area to closest ton (*metric ton*) per day. For uniform load method, Tickets are not required.

.....  
Spec. No.: 2321 (cont.)  
Contract Items: Aggregate  
Stockpile Aggregate, Class \_\_\_\_\_

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material used on Form 28226. For the Final, submit these forms in booklet or folder form with proper reference on the I.R.A. See Vehicular Measure.

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y. (0. 1 *m*<sup>3</sup>) Round total for each stockpile to the closest C.Y. (W) per day.

*Note:* When 2321 material is mixed in a hot mix Plant, convert recorded weights to individual quantities of aggregate and bituminous material, and show computations.

---

Spec. No.: 2331 (Spec 2000)  
Contract Items: Wearing Course Mixture  
Binder Course Mixture  
Leveling Course Mixture  
Base Course Mixture  
Shoulder Mixture  
Bituminous Mixture for (Specific Purpose)  
Bituminous Mixture Production  
Type \_\_\_\_\_, \_\_\_\_\_ Course Mixture

Unit - U.S.: Ton  
Unit - Metric: (*Metric Ton*)

Documentation: Record non-uniform loads on Form 2177.  
Record uniform loads on either Form 28226 or Form 2177.

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Automatic printout tickets may be substituted for either of the above two methods.

For the Final, submit these Forms or automatic printout tickets in booklet, packet or bundle form with proper reference on the LR.A.

Sq. Yd. In. (Square Meter, Millimeter) - Record computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (Scale) - Non-uniform loads weigh on approved scales. Round each load to the closest 0.1 ton (0.1 *metric ton*).

Weight (Mass) (Sq. Yd. Inch (Square Meter, Millimeter Measure area in square yards (W) and compute weight based on thickness.

Uniform Loads - Weigh on approved scales. Round each load to the closest ton (0.1 *metric ton*). If Form 2177 is used, the first ticket each day and the first ticket reflecting any subsequent changes in batch weight and/or number of batches per load, shall be modified to include: (1) Weight per batch, (2) number of batches per load, and (3) total weight per load.

.....  
Spec. No.: 2331 (cont.)  
Contract Items: Irregular Width Paving  
Type \_\_\_\_\_, \_\_\_\_\_ Course Mixture, \_\_\_\_\_, mm  
thick

Unit - U.S.: S. Y.  
Unit - Metric: (Square Meter)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measurements and computations will be based on actual surface dimensions as placed.



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*Note:* If either mineral filler or hydrated lime is to be required, the Item Name must be expanded by adding the words: (with Filler) or (with Lime).

---

Spec. No.: 2340 Plant Mixed Bituminous Pavement (Spec 2000)  
Quality Control / Quality Assurance  
(Type 31,41, 47,61)

Contract Items: Wearing Course Mixture  
Binder Course Mixture  
Leveling Course Mixture  
Base Course Mixture  
Shoulder Mixture  
Bituminous Mixture for (Specific Purpose)  
Bituminous Mixture Production  
Type \_\_\_\_\_, \_\_\_\_\_ Course Mixture  
Contractor Testing - (A)  
*(A)- Payment for Contractor Testing item No. 2340.501 by the ton (metric ton) will be made only when the pay item is specified in the Contract. If specified, payment for Contractor Testing of the plant mixed bituminous surface will be compensation for all costs of the required testing. Contractor Testing will be paid for as follows :Item 2340.501 - Contractor Testing*

Unit - U.S.: Ton  
Unit - Metric: (Metric Ton)

Documentation: Record Computations. For the Final, submit these Forms or automatic printout tickets in booklet, packet or bundle form with proper reference on the IRA.

Method of Measurement: Weight (Mass) (Scale) - Based on the mass of plant mixed bituminous mixture used and tested.

.....

Spec. No.: 2340 (cont.)  
Contract Items: Wearing Course Mixture  
Binder Course Mixture  
Shoulder Mixture  
Leveling Course Mixture  
Base Course Mixture

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---

Bituminous Mixture for (Specific Purpose)  
Bituminous Mixture Production

Unit - U.S.: Ton  
Unit - Metric: (*Metric Ton*)  
Documentation: Record non-uniform loads on Form 2177. See Delivery Tickets.

Record uniform loads on either Form 28226 or Form 2177. See Uniform Load.

Automatic printout tickets may be substituted for either of the above two methods.

For the Final, submit these Forms or automatic printout tickets in booklet, packet or bundle form with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (Scale) - Non-uniform loads weigh on approved scales. Round each load to the closest 0.1 ton (0.1 *metric ton*). Uniform Loads - Weigh on approved scales. Round each load to the closest 0.1 ton (0.1 *metric ton*). If Form 2177 is used, the first ticket each day and the first ticket reflecting any subsequent changes in batch weight and/or number of batches per load, shall be modified to include:  
(1) Weight per batch, (2) Number of batches per load  
and  
(3) Total weight per load.

*Note:* *If either mineral filler or hydrated lime is to be required, the Item Name must be expanded by adding the words: (with Filler) or (with Lime).*

.....

Spec. No.: 2340 (cont.)  
Contract Items: Irregular Width Paving

Unit - U.S.: Sq. Yd.  
Unit - Metric: (*Square Meter*)

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Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measurements and computations will be based on actual surface dimensions as placed.

---

Spec. No.: 2350 (Spec 2000)  
Plant Mixed Asphalt Pavement  
Quality Control / Quality Assurance  
(Type LV- MV - HV)

Contract Items: Type (1) (2) Wearing Course Mixture (4) *Metric ton (ton)*  
Type (1) (2) Non Wearing Course Mixture (4) *Metric ton (ton)*  
Type (1) (2) (3) Course mixture (4), (5) mm (inch) thick  
*Square Meter (Square yard)*  
Type (1) (2) (3) Course Mixture (4) *(Square Yard Inch)*  
Type (1) (2) Bituminous Mixture for Specified Purpose  
*Metric ton (ton)*  
Type (1) (2) Bituminous Mixture Production -*Metric ton (ton)*  
(1)- *Traffic Level Designation (L VMV or HV as appropriate)*  
(2)- *Aggregate size designation*  
(3)- *"Wearing" or "Non Wearing" as appropriate*  
(4)- *A C Grade Designation*  
(5)- *Specified Lift Thickness*

Unit - U.S.: Ton  
Unit - Metric: *(Metric Ton)*

Documentation: Record non-uniform loads on Form 2177.

Record uniform loads on either Form 28226 or Form 2177.

Automatic printout tickets may be substituted for either of the above two methods. For the Final, submit these Forms or automatic printout tickets in booklet, packet or bundle form with proper reference on the LR.A.

Sq. Yd. In. (Square Meter, Millimeter) - Record computations. For the Final, submit these records with proper reference on the I.R.A. \*

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Method of Measurement: Weight (Mass) (Sq. Yd. Inch (Square Meter, (Millimeter)  
Measure area in square yards ( $m^2$ ) and compute weight based on thickness. \*

\* - Asphalt Mixtures measured by the Square Meter (Square Yard) per specified thickness (mm or inch) and for mixtures measured by the Square Yard Inch. Asphalt mixture of each type and for each specific course will be measured separately by area and the thickness shall be based on the planned dimensions.

Note: In the absence of appropriate Contract items covering shoulder surfacing and other special construction, the accepted quantities of material used for these purposes will be included for payment with the wearing course materials.

Weight (Mass) (Scale) - Non-uniform loads weigh on approved scales. Round each load to the closest 0.1 ton (0.1 metric ton).

Uniform Loads - Weigh on approved scales. Round each load to the closest ton (0.1 metric ton). If Form 2177 is used, the first ticket each day and the first ticket reflecting any subsequent changes in batch weight and/or number of batches per load, shall be modified to include: (1) Weight per batch, (2) number of batches per load, and (3) total weight per load.

.....

Spec. No.:	2350 (cont.)
Contract Items:	Type _____, _____ Course Mixture, _____ mm thick
Unit - U.S.:	S. Y.
Unit - Metric:	(Square Meter)
Documentation:	Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measurements and computations will be based on actual surface dimensions as placed.

---

Spec. No.:	2355
Contract Items:	Bituminous Material for Fog Seal

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Unit - U.S.: Gal.  
Unit - Metric: (*Liter*)

Documentation: Record volume on Form 21841. For the Final, submit these forms in booklet or packet form with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure - Measure each distributor load by sticking, by weight or by calibrated meter. Convert to liquid volume at 60° F (15° C). (Do not include additional water mixed with asphalt emulsions.)

.....

Spec. No.: 2356  
Contract Items: Bituminous Material for Seal Coat

Unit - U.S.: Gal.  
Unit - Metric: (*Liter*)

Documentation: Record volume on Form 21841. For rile Final, submit these forms in booklet or packet form with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure - Measure each distributor load by sticking, by weight or by calibrated mater. Convert to liquid volume at 60° F (15° C). (Do not include additional water mixed with asphalt emulsions.)

.....

Spec. No.: 2356 (cont.)  
Contract Items: Seal Coat Aggregate

Unit - U.S.: Ton  
Unit - Metric: (*Metric Ton*)

Documentation Record uniform loads on Form 28226. Record non-uniform loads on Form 2177 with tape, slip or other accumulation showing total per day. For the Final, submit these Forms in booklet or packet form with proper reference on the I.R.A. See Delivery Tickets. See Uniform Load note – section .410.

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scales. Round each load to closest 0.1 ton (0.1 *metric ton*).

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Round total for each area to closest ton (*metric ton*) per day.

.....  
Spec. No.: 2356 (cont.)  
Contract Items: Seal Coat Aggregate (LV)

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and computations on Form 2141.  
Record the load-count of material used on Form 28226. For the Final, submit these forms in booklet or folder form with proper reference on the I.R.A. See Vehicular Measure.

Method of Measurement: Vehicular Measure - Compute vehicle capacities to the closest 0.1 C.Y. (0.1 m<sup>3</sup>) Round total for each area to the closest C .Y. (M) per day.

---

Spec. No.: 2357  
Contract Items: Bituminous Material for Tack Coat

Unit - U.S.: Gal.  
Unit - Metric: (*Liter*)

Documentation: Record volume on Form 21841. For the Final, submit these Forms in booklet or packet form with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure - Measure each distributor load by sticking, by weight or by calibrated meter. Convert to liquid volume at 60° F (15° C). (Do not include additional water mixed with asphalt emulsions.)

---

Spec. No.: 2358  
Contract Items: Bituminous Material for Prime Coat

Unit - U.S.: Gal.  
Unit - Metric: (*Liter*)

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Documentation: Record volume on Form 21841. For the Final, submit these forms in booklet or packet form with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure - Measure each distributor load by sticking, by weight or by calibrated meter. Convert to liquid volume at 60° F (15° C).

---

Spec. No.: 2360 Plant Mixed Bituminous Pavement (Super pave)

Contract Items: Type (1) (2) Wearing Course Mixture (3) (4) *Metric ton (ton)*  
Type (1) (2) Non Wearing Course Mixture (3) (4) *Metric ton(ton)*  
Type (1) (2) (3) Course mixture (4), (5) (6) mm (inch) thick  
*Square Meter (Square yard)*  
Type (1) (2) (3) Course Mixture (4) (5) *(Square Yard Inch)*  
Type (1) (2) Bituminous Mixture for Specified Purpose  
*Metric ton (ton)*  
Type (1) (2) Bituminous Mixture Production -*Metric ton (ton)*

(1)- *Mixture Design Type (SP or SM as appropriate)*  
(2)- *Aggregate size designation, 9.5, 12.5 or 19 as appropriate*  
(3)- *"Wearing" or "Non Wearing" as appropriate*  
(4)- *Traffic Level as per table 2360-1 in 2000 Specifications*  
(5) -*AC binder grade Designation*  
(6)- *Specified Lift Thickness*

*Note: In the absence of appropriate Contract items covering shoulder surfacing and other special construction, the accepted quantities of material used for these purposes will be included for payment with the wearing course materials.*

Unit - U.S.: Ton  
Unit - Metric: (Metric Ton)

Documentation: Record non-uniform loads on Form 2177.

Record uniform loads on either Form 28226 or Form 2177.

Automatic printout tickets may be substituted for either of the above two methods. For the Final, submit these Forms or

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automatic printout tickets in booklet, packet or bundle form with proper reference on the LR.A.

Sq. Yd. In. (Square Meter, Millimeter) - Record computations. For the Final, submit these records with proper reference on the I.R.A.\*

Method of Measurement: Sq. Yd. Inch (Square Meter, (Millimeter)) - Measure area in square yards ( $m^2$ ) and compute weight based on thickness. \*

*\*For Asphalt Mixtures measured by the Square Meter (Square Yard) per specified thickness (mm or inch) and for mixtures measured by the Square Yard Inch. Asphalt mixture of each type and for each specific course will be measured separately by area and the thickness shall be based on the final dimensions.*

Weight (Mass) (Scale) - Non-uniform loads weigh on approved scales. Round each load to the closest 0.1 ton (0.1 metric ton).

Uniform Loads - Weigh on approved scales. Round each load to the closest ton (0.1 metric ton). If Form 2177 is used, the first ticket each day and the first ticket reflecting any subsequent changes in batch weight and/or number of batches per load, shall be modified to include: (1) Weight per batch, (2) number of batches per load, and (3) total weight per load.

.....  
Spec. No.: 2360 (cont.)  
Contract Items: Type \_\_\_\_\_, \_\_\_\_\_ Course Mixture, \_\_\_\_\_, mm thick  
Unit - U.S.: S. Y.  
Unit - Metric: (Square Meter)  
Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measurements and computations will be based on actual surface dimensions as placed.

---

Spec. No.: 2401  
Contract Items: Structure Concrete (Grade or Mix No.)



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Structure Excavation, Class \_\_\_\_\_

Unit - U. S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

.....  
Spec. No.: 2401 (cont.)

Contract Items: Structure Concrete (Mix No.)  
Bridge Slab Concrete (Mix No.)  
Sidewalk Concrete (Mix. No.)  
Raised Median Concrete (Mix No.)

Unit - U.S.: S.F.  
Unit - Metric: (*Square Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

.....  
Spec. No.: 2401 (cont.)

Contract Items: Type \_\_\_\_\_ Railing Concrete (Mix No.)  
\_\_\_\_\_ Median Barrier Concrete (Mix No.)

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

.....  
Spec. No.: 2401 (cont.)

Contract Items: Reinforcement Bars Delivered  
Reinforcement Bars Placed  
Reinforcement Bars \_\_\_\_\_  
Steel Fabric \_\_\_\_\_  
Spiral Reinforcement

Unit - U.S.: Lb.  
Unit - Metric: (*Kilogram*)

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Documentation: Record on Form 2215. For the Final, submit these forms in booklet or folder form with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation) - Compute the mass of re-bars based on the lengths shown in the Plans. The quantity measured will include only those splices, which are shown in the Plans. Use the table shown in Specification 2472.4A. Do not include bar supports or tie wires. For Steel Fabric compute the mass incorporated into the structure based on the quantity shown in the plans. Spiral Reinforcement is based on the mass shown in the Mn/DOT Bridge Construction Manual.

---

Spec. No.: 2402  
Contract Items: Structural Metals  
(All items paid for by the pound (kilogram))

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Weight Mass (By Computation)- Compute the mass of all structural metals based on the net finished dimensions shown in the Plans using a density of 490 lbs. per cubic foot (7849 kg/m<sup>3</sup>).

.....  
Spec. No.: 2402 (cont.)  
Contract Items: Floor Drains, Type \_\_\_\_\_  
\_\_\_\_\_ Bearing Assemblies  
Elastomeric Bearing Pads, Type \_\_\_\_\_  
Elastomeric Bearing Assemblies, Type \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record on the I.R.A. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Unit - Physical count.

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.....

Spec. No.: 2402 (cont.)  
Contract Items: Ornamental Metal Railing  
Pipe Railing  
Plate Railing  
Expansion Joint Devices, Type \_\_\_\_\_

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

---

Spec. No.: 2403  
Timber Bridge Construction

Contract Items: Untreated Timber  
Treated Timber

Unit - U.S.: 1000 Board Feet  
Unit - Metric: (*Cubic Meter*)

Documentation: Record computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Miscellaneous - Measurements and computations based on nominal sizes and lengths incorporated in the structure.

.....

Spec. No.: 2403 (cont.)  
Contract Items: Hardware

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record computations. For the Final, submit these records with proper references on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation) - Compute the hardware mass based on the unit of mass shown in the plans. (Do not include the mass of rails, dowels, or panel hardware in quantities for payment.)

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Spec. No.: 2403 (cont.)  
Contract Items: Prefabricated Timber Panels, Type \_\_\_\_\_  
Glued Laminated Deck Panels, Type \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record on the I.R.A. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Unit - Physical count. (Panel hardware is included in this item).

---

Spec. No.: 2404  
Contract Items: Concrete Wearing Course (Type or Mix No.)

Unit - U.S.: S.F.  
Unit - Metric: (*Square Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - The Concrete Wearing Course will be measured by surface area, as computed from specific dimensions. No deduction will be made for the surface area of expansion devices or other miscellaneous appurtenances.

---

Spec. No.: 2405  
Contract Items: Pre-stressed Concrete Beams, Type \_\_\_\_\_  
Pre-stressed Concrete Double Tee-Beams, Type \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record on the I.R.A. For the Final, submit the I.R.A. as Source Documentation.

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Method of Measurement: Unit - Physical count.

.....

Spec. No.: 2405 (cont.)

Contract Items: Pre-stressed Concrete Beams \_\_\_\_\_ Inch (\_\_\_\_\_ mm)

Unit - U.S.: L.F.

Unit - Metric: (*Meter*)

Documentation: Record measurements on the I.R.A. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Linear Foot (*meter*) - Measured by summation of the individual lengths, out to out, along the centerlines of beams.

.....

Spec. No.: 2405 (cont.)

Contract Items: Diaphragms for Type \_\_\_\_\_ Pre-stressed Beams

Unit - U.S.: L.F.

Unit - Metric: (*Meter*)

Documentation: Record measurements on the I.R.A. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Linear Foot (*meter*) - Measure horizontal distance of intermediate diaphragms from centerline to centerline of beam along axis of the diaphragms.

---

Spec. No.: 2411

Contract Items: Structure Excavation Class \_\_\_\_\_  
Structure Concrete (Mix No.)

Unit - U.S.: C.Y.

Unit - Metric: (*Cubic Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

.....

Spec. No.: 2411 (cont.)

Contract Items: Concrete (Type of Structure)

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Unit - U.S.: S.Y.  
Unit - Metric: (*Square Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measurements and computations will be based on actual surface dimensions as placed.

. . . . .  
Spec. No.: 2411 (cont.)  
Contract Items: Reinforcement Bars

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record on Form 2215. For the Final, submit these forms in booklet or folder with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation) - Compute the mass of reinforcement bars based on the lengths shown in the Plans. The quantity measured will include only those splices, which are shown in the Plans. Use table shown in Specification 2472.4A. Do not include bar supports or tie wires.

. . . . .  
Spec. No.: 2411 (cont.)  
Contract Items: Granular Backfill (CV)  
Aggregate Backfill (CV)

Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Computations will be based on the dimensions shown in the Plans, described in the Specifications, or designated by the Engineer.

. . . . .  
Spec. No.: 2411 (cont.)  
Contract Items: Granular Backfill (LV)  
Aggregate Backfill (LV)

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Unit -U.S.: C.Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of materials used on Form 28226. For the Final, submit the above Forms in booklet or folder form, with proper reference on the I.R.A. See Vehicular Measure.

Method of Measurement: Vehicular Measure - Measure and compute vehicle capacities to closest 0.1 C.Y. (0.1 m) Round the total for each area to the closest C.Y. (M) per day.

.....

Spec. No.: 2411 (cont.)  
Contract Items: Concrete Structures, Design \_\_\_\_\_  
Concrete (Type of Structure) \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2412

Contract Items: \_\_\_\_\_ in (mm) X \_\_\_\_\_ in(mm) Pre-cast Concrete Box Culvert

Unit - U.S.: L. F.  
Unit - Metric: (Meter)

Documentation: Record measurements. For the Final, submit these records with proper reference on the IR.A.

Method of Measurement :Linear Foot (meter) - Measured as a summation of the nominal laying lengths of the individual sections incorporated into each structure. Transition sections measured for payment as the larger (or more costly) size.

.....

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Spec. No.: 2412 (cont.)  
Contract Items: \_\_\_\_\_ in (mm) X \_\_\_\_\_ in(mm) Pre-cast Concrete Box  
Culvert End

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2422  
Contract Items: Structure Excavation, Class \_\_\_\_\_

Unit -U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: See Plan Quantity.  
Method of Measurement: See Plan Quantity.

.....  
Spec. No.: 2422 (cont.)  
Contract Items: Metal Crib Walls  
Concrete Crib Walls (2000 Spec)

Unit - U.S.: S.F.  
Unit - Metric: (*Square Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute the area of the front face of wall, based on actual completed dimensions.

.....

Spec. No.: 2422 (cont.)  
Contract Items: Concrete Crib Walls

Unit - U.S.: S.Y.  
Unit - Metric: (*Square Meter*)



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Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute the area of the front face of wall, based on actual completed dimensions.

.....

Spec. No.: 2422 (cont.)  
Contract Items: Earth Crib Filling  
Gravel Crib Filling  
Rock Crib Filling

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and computations on Form 2141. Record load-count of material used on Form 28226. For the final, submit these Forms with proper reference on the I.R.A. See Vehicular Measure.

Method of Measurement: Vehicular Measure - Compute vehicle capacities to closest 0.1 C.Y. (*0.1 m3*) Round total for each area to closest C.Y. (*m3*) per day.

---

Spec. No.: 2433  
Contract Items: Structure Removals  
Remove (Item Name)  
Place Used (Item Name)

Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record on the I.R.A. as a decimal for partial estimate. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump Sum - Engineer will estimate the dollar-value percentage of the completed work.

.....

Spec. No.: 2433 (cont.)  
Contract Items: Remove (Item Name)  
Place Used (Item Name)

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Unit - U. S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record Structural Metals Engineer's quantities on the I.R.A. For the Final, submit these reports in folder or booklet form with proper reference on the I.R.A.

Method of Measurement: Miscellaneous - Contractor will furnish physical properties to Structural Metal's Engineer.

.....  
Spec. No.: 2433 (cont.)  
Contract Items: Remove (Item Name)

Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Measure length, width and depth and compute volume. No additional compensation will be made for reinforcement encountered in removal.

.....  
Spec. No.: 2433 (cont.)  
Contract Items: Place Used (Item Name)  
Unit - U.S.: 1000 Board Feet  
Unit - Metric: (*Cubic Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement : Miscellaneous - Measurement and computations based on nominal sizes and actual length measurements.

.....  
Spec. No.: 2433 (cont.)  
Contract Items: Remove (Item Name)

Unit - U.S.: S. F.  
Unit - Metric: (*Square Meter*)

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---

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute the area using the actual width and length measurements.

.....  
Spec. No.: 2433 (cont.)  
Contract Items: Remove (Item Name)  
Place Used (Item Name)

Unit - U.S.: L.F.  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit the records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) - Measure longitudinally along the center of the unit.

.....  
Spec. No.: 2433 (cont.)  
Contract Items: Remove (Item Name)  
Place Used (Item Name)  
Anchorages, Type \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2442  
Contract Items: Remove Existing Bridge

Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record on the I.R.A. For the Final, submit the I.R.A. as Source Documentation.

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---

Method of Measurement: Lump Sum - Pay the percent completed on each Partial Estimate. Pay 100 % of each item on the satisfactory completion.

---

Spec. No.: 2451  
Contract Items: Structure Excavation, Class

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

---

Spec. No.: 2451 (cont.)  
Contract Items: Granular Backfill (LV)  
Aggregate Backfill (LV)  
Granular Bedding (LV)  
Aggregate Bedding (LV)  
Course Filter Aggregate (LV)  
Fine Filter Aggregate (LV)

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the loads used on Form 28226. For the Final, submit the above forms with proper reference on the I.R.A.

Method of Measurement: Vehicular Measure - Compute vehicle capacities to closest 0.1 C.Y. (0.1 m<sup>3</sup>) Round total for each area to closest C.Y. (m<sup>3</sup>) per day.

---

Spec. No.: 2451 (cont.)  
Contract Items: Granular Backfill (CV)  
Aggregate Backfill (CV)  
Granular Bedding (CV)  
Aggregate Bedding (CV)  
Course Filter Aggregate (CV)  
Fine Filter Aggregate (CV)

Unit - U.S.: C.Y.

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---

Unit - Metric: (Cubic Meter)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Computations will be based on the dimensions shown in the Plans, described in the Specifications, or designated by the Engineer.

. . . . .  
Spec. No.: 2451 (cont.)  
Contract Items: Soil Bearing Tests

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record the number of tests completed to the Engineer's satisfaction. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2452  
Contract Items: Untreated Timber Piling Delivered  
Treated Timber Piling Delivered  
Cast-in-Place Concrete Piling Delivered  
Steel H-Piling Delivered

Unit - U.S.: L. F.  
Unit - Metric: (Meter)

Documentation: Record on form 2210. For the Final, submit Form 2210 with proper reference on the L.R.A.

Method of Measurement: Linear Foot (meter)-Measured as a summation of the lengths (as authorized by the Engineer) of acceptable piling delivered to the job site.

. . . . .  
Spec. No.: 2452 (cont.)  
Contract Items: Untreated Timber Piling Driven  
Treated Timber Piling Driven  
Cast-in-Place Concrete Piling Driven  
Steel H-Piling Driven

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Unit -U.S.: L.F.  
Unit - Metric: (Meter)

Documentation: Record on Form 2210. For the Final, submit Form 2210 in folder or booklet form with proper reference on the I.R.A.

Method of Measurement: Linear Foot (meter)-Measure length of acceptable piling driven below cut off

.....  
Spec. No.: 2452 (cont.)  
Contract Items: Unteated Timber Test Piles, \_\_\_\_\_ Feet (m) Long  
Treated Timber Test Piles, \_\_\_\_\_ Feet (m) Long  
Cast-in-Place Concrete Test Piles, \_\_\_\_\_ Feet (m) Long  
Steel H-Test Piles, \_\_\_\_\_ Feet (m) Long

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record on Form 22 10. For the Final, submit Form 22 10 in folder or booklet form with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

.....  
Spec. No.: 2452 (cont.)  
Contract Items: Reinforcement Bars

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record computations. For the Final, submit these forms in booklet form with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation) - Compute the mass of reinforcement bars based on lengths shown in the Plans. The quantity measured will include only those splices, which are shown in the Plans. Use table shown in Specification 2472.4A. Do not include bar supports or tie wires.

.....  
Spec. No.: 2452 (cont.)

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Contract Items: Pile Load Tests, Type \_\_\_\_\_

Unit - U.S.: Each

Unit - Metric: Each

Documentation: Record on the I.R.A. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2461

Contract Items: Concrete, Mix No. \_\_\_\_\_

Unit - U.S.: C.Y.

Unit - Metric: (*Cubic Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

.....

Spec. No.: 2461 (cont.)

Contract Items: Concrete, Mix \_\_\_\_\_

Unit - U.S.: C.Y.

Unit - Metric: (*Cubic Meter*)

Documentation: Use Approximate Volume show on Form 2158 minus accountable waste. For the Final, submit Forms 2158, initialed and dated by the field inspector, with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure - Computed, theoretical volume based on the mass of the batch ingredient. The quantities so determined will be reduced for payment by all account able waste.

---

Spec. No.: 2472

Contract Items: Reinforcement Bars  
Steel Fabric  
Spiral Reinforcement

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---

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation) - Compute the mass of reinforcement bars based on lengths shown in the Plans. The quantity measured will include only those splices, which are shown in the Plans. Use table shown in Specification 2472.4A. Do not include bar supports or tie wires.

When computing the weight of Steel Fabric, use the nominal mass incorporated into the structure based on the quantity shown in the Plans.

When computing mass of Spiral Reinforcement, use the table in the Mn/DOT Bridge Construction Manual.

. . . . .  
Spec. No.: 2472 (cont.)  
Contract Items: Couplers (Reinforcement Bars) T-\_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record on the I.R.A. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2476 (Spec 2000)  
Contract Items: Painting Metal Structures

Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record on the I.R.A. as a decimal for Partial Estimate. For the Final, submit the I.R.A. as Source Documentation.



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---

Method of Measurement: Lump Sum - Pay the percent completed on each Partial Estimate. Pay 100% of this item upon satisfactory completion.

.....  
Spec. No.: 2476 (cont.)  
Contract Items: Painting Metal Structures

Unit - U.S.: S. F.  
Unit - Metric: (Square Meter)  
Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

---

Spec. No.: 2478  
Contract Items: Epoxy Zinc-Rich Paint System (Field) (2000)  
Organic Zinc-Rich Paint System (Field) 2005  
Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record on the I.R.A. as a decimal for Partial Estimate. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump Sum - Pay the percent completed on each Partial Estimate. Pay 100% of this item upon satisfactory completion.

.....  
Spec No.: 2478(cont.)  
Contract Items: Epoxy Zinc-Rich Paint System (Shop)  
Epoxy Zinc-Rich Paint System (Old)  
Epoxy Zinc-Rich Paint System (New)  
Organic Zinc-Rich Paint System (Shop)  
Organic Zinc-Rich Paint System (Old)

Unit - U.S.: S.F.  
Unit - Metric: (Square Meter)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

---

Spec. No.: 2479  
Contract Items: Inorganic Zinc-Rich Paint System (Shop)

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---

Inorganic Zinc-Rich Paint System (Field)  
Inorganic Zinc-Rich Paint System (Shop and field)

Unit - U.S.: S.F.  
Unit - Metric: (*Square Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

---

Spec. No.: 2481  
Contract Items: Joint Waterproofing

Unit - U. S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) Measure the length of the joints waterproofed.

---

Spec. No.: 2501  
Contract Items: Pipe Culverts \_\_\_\_\_

Spec. No.: 2501 (cont.)  
Contract Items: Culvert Excavation

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: See Plan Quantity.  
Method of Measurement: See Plan Quantity.

.....  
Spec. No.: 2501 (cont.)  
Contract Items: Culverts, Cattle Passes  
(All types, sizes, classes, and shapes)  
Install \_\_\_\_\_

Unit -U.S.: L. F.  
Unit - Metric: (*Meter*)

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---

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) - Measured as a summation of the nominal lengths. Transitional sections will be measured as the larger size pipe.

.....

Spec. No.: 2501 (cont.)  
Contract Items: Aprons (All types, sizes)  
Flap Gates  
Diaphragms  
Transition Sections  
\_\_\_\_\_ (*mm*) Safety Apron and Grate  
\_\_\_\_\_ (*mm*) RC Dissipator Ring  
Install \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records in booklet form with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count (except that aprons furnished by the Department will be measured as additional culvert length)

---

Spec. No.: 2502  
Contract Items: Drains (All types, sizes)  
Install \_\_\_\_\_

Unit - U.S.: L.F.  
Unit - Metric: (*Meter*)

Documentation: Record Measurements. For the Final, submit these records with Proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) - Measured along centerline of drain from free outlet to junction with in-place pipe, or center of structure.

.....

Spec. No.: 2502 (cont.)

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Contract Items: \_\_\_\_\_ " (mm) Pre-cast Concrete Headwall  
Install \_\_\_\_\_

Unit - U.S.: Each

Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2503

Contract Items: Sewer Pipe (All types, classes and shapes)

Install \_\_\_\_\_

Unit - U.S.: L.F.

Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit these records with proper reference on the LR.A.

Method of Measurement: Linear Foot (*meter*) - Measured along centerline of sewer from free outlet to junction with in-place pipe, or center of structure.  
Transition sections will be measured as the larger size pipe.

.....  
Spec. No.: 2503 (cont.)

Contract Items: Flap Gates (All types, sizes, and shapes)

Install \_\_\_\_\_

Unit - U.S.: Each

Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2506

Contract Items: Construct Drainage Structure, Design \_\_\_\_\_

Reconstruct Drainage Structure

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Unit - U.S.: L.F.  
Unit - Metric: (Meter)

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (meter) - Measure from the invert elevation of the outlet pipe to the bottom of the ring or frame casting, plus 0.70 feet (0.20 m). For T-Sections, measure from flow line to bottom casting. When apron is used on inlet, measure from inside periphery opposite opening in the joint where pipe and apron meet. Measure to the closest 0.1 L.F. (30 mm).

Linear Foot (meter) - Measure from bottom of reconstructed portion to bottom of frame or ring casting, to the closest 0.1 L. F. (30 mm)

.....

Spec. No.: 2506 (cont.)  
Contract Items: Construct Drainage Structure, Design \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count. Measure as a complete structure including any casting furnished and installed.

.....

Spec. No.: 2506 (cont.)  
Contract Items: Casting Assembly  
Install Casting  
Adjust Frame and Ring Casting

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the LR.A.

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Method of Measurement: Unit - Physical count.

---

Spec. No.: 2511  
Contract Items: Random Riprap, Class \_\_\_\_\_  
Quarry-run Riprap  
Hand-placed Riprap  
Grouted Riprap  
Granular Filter

Unit - U.S.: C.Y.  
Unit - Metric: (Cubic *Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Measure the surface dimensions as staked in the field and multiply by the specified thickness.

.....  
Spec. No.: 2511 (cont.)  
Contract Items: Random Riprap, Class \_\_\_\_\_  
Quarry-run Riprap  
Granular Filter Material

Unit - U.S.: Ton  
Unit - Metric: (*Metric Ton*)

Documentation: Record uniform loads on Form 28226. Record non-uniform loads on Form 2177, with tape, slip or other accumulation showing total per day or area. For the Final, submit the above applicable forms in booklet or packet form with proper reference on the I.R.A. See uniform load note – section .410.

Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scale. Round each load to closest 0.1 ton (0.1 *metric ton*). Round total for each area to closest ton (*metric ton*) per day.

.....  
Spec. No.: 2511 (cont.)  
Contract Items: Geotextile Filter, Type \_\_\_\_\_

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---

Unit - U.S.: S. Y.  
Unit - Metric: (*Square Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the LR.A.

Method of Measurement: Area Computation - Filter material will be measured and computed on the basis of actual surface dimensions as staked, with no allowance for overlaps.

---

Spec. No.: 2512  
Contract Items: Gabion  
Revet Mattress

Unit - U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: See Plan Quantity.

Method of Measurement: See Plan Quantity.

---

Spec. No.: 2514  
Contract Items: Concrete Slope Paving  
Aggregate Slope Paving

Unit - U.S.: S.Y.  
Unit - Metric: (*Square Meter*)

Documentation: Record on Form 28233. Modify Form 28233 to show width of material placed. For the Final, submit these forms in packet or booklet form with proper reference on the I.R.A.

Method of Measurement: Area Computation - Compute the square feet (m2) of surface area as staked in field.

---

Spec. No.: 2520  
Contract Items: Lean Mix Backfill

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

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Documentation: Use Approximate Volume show on Form 2158 minus accountable waste. For the Final, submit Forms 2158, initialed and dated by the field inspector, with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure - Computed, theoretical volume based on the mass of the individual batch ingredients. The quantities so determined will be reduced for payment by all account able waste.

---

Spec. No.: 2521  
Contract Items: \_\_\_\_\_ (mm) Concrete Walk  
                  \_\_\_\_\_ (mm) Bituminous Walk  
                  \_\_\_\_\_ (mm) Concrete Terrace  
                  \_\_\_\_\_ (mm) Bituminous Terrace

Unit - U. S.: S. F.  
Unit - Metric: (*Square Meter*)

Documentation: Record on Form 28233. Modify Form 28233 to show width of material placed. For the Final, submit these forms in packet or booklet form with proper reference on the I.R.A.

Method of Measurement: Area Computation - Each uniform thickness will be measured separately by top surface area.

.....

Spec. No.: 2521 (cont.)  
Contract Items: \_\_\_\_\_ Sawing Concrete Walk

Unit - U.S.: L.F.  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit the records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) - Measure longitudinally along the sawcut.

---

Spec. No.: 2531  
Contract Items: Concrete Curb & Gutter, Design \_\_\_\_\_  
                  Concrete Curb, Design \_\_\_\_\_



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---

Concrete Median

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record on Form 28233. For the Final, submit these forms in booklet form with proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) - Measure along face of the curb at the gutter line or along centerline of the longitudinal axis. (If a variance from basic design results in an increase in cross sectional area, a new Unit Price must be negotiated.)

.....

Spec. No.: 2531 (cont.)  
Contract Items: Concrete Median  
\_\_\_\_\_ " (*mm*) Concrete Driveway Pavement  
Pedestrian Curb Ramp (Type \_\_\_\_\_)

Unit - U.S.: S.Y.  
Unit - Metric: (*Square Meter*)

Documentation: Record on Form 28233. Modify Form 28233 to show width of material placed. For the Final, submit these forms in booklet form with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure length as staked, times plan width, or authorized change in width.

.....

Spec. No.: 2531 (cont.)  
Contract Items: Structural Concrete  
Concrete (Type of Structure)

Unit -U.S.: C. Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record on Form 28233. Modify Form 28233 to show cross sectional area shown in the Plans. For the Final, submit these forms in booklet form with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) –

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Computations based on the length as staked, times the cross-sectional area shown in the Plans or other-wise authorized.

.....  
Spec. No.: 2531 (cont.)  
Contract Items: Pedestrian Curb Ramp (Type \_\_\_\_\_)

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Measure as a complete in-place item.

---

Spec. No.: 2533  
Contract Items: Concrete Median Barrier, Design (1) Type (2)  
Concrete Median Barrier & Glare Screen, Design (1)  
Portable Precast Concrete Barrier, Design (1)  
(1) Current Standard Plate  
(2) Type A, AA, AL, Transition, A Step, or AA Step

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record on Form 28233. For the Final, submit these forms in booklet form with proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) - Measure length on the top of the barrier along the centerline of Type A barriers and 3 inches (*75 mm*) back of the front face of Type AA barriers. Transitions special and modified barriers, shall be measured on the top of the barrier and 3 inches (*75 mm*) back of the front face.

---

Spec. No.: 2535  
Contract Items: Bituminous Curb

Unit - U.S.: L.F.  
Unit - Metric: (*Meter*)

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Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (meter) - Measure along face of curb at the gutter line.

Spec. No.: 2545  
Contract Items: Electric Lighting System  
Electric Power System  
Conduit System

Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record on the I.R.A. as a decimal for Partial Estimate. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump Sum - Pay the percent completed on each Partial Estimate. Pay 100% of this item upon satisfactory completion.

.....  
Spec. No.: 2545 (Cont)  
Contract Items: Sign Lighting System - \_\_\_\_\_ Fixtures  
Sign Lighting System Bridge Mounted - Fixtures

Unit - U.S.: System  
Unit - Metric: System

Documentation: Record on the I.R.A. as a decimal for Partial Estimate. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump Sum - Pay the percent completed on each Partial Estimate. Pay 100% of this item upon satisfactory completion.

.....  
Spec. No.: 2545 (cont.)  
Contract Items: Lighting Unit, Type \_\_\_\_\_  
Luminaire  
Underpass Lighting Fixture, Type \_\_\_\_\_

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Light Base, Design \_\_\_\_\_  
Service Cabinet, \_\_\_\_\_ Type \_\_\_\_\_  
Junction Box  
Pull Box  
Equipment Pad  
Handhole  
\_\_\_\_\_ foot (m) Wood Pole, Class \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

.....

Spec. No.: 2545 (cont.)  
Contract Items: \_\_\_\_\_ " (mm) Rigid Steel Conduit  
\_\_\_\_\_ " (mm) Intermediate Metal Conduit  
\_\_\_\_\_ " (mm) Nonmetallic Conduit  
Underground Wire, \_\_\_\_\_ Conductor No. \_\_\_\_\_  
Armored Cable, \_\_\_\_\_ Conductor No. \_\_\_\_\_  
Overhead Light Cable, \_\_\_\_\_ Conductor No. \_\_\_\_\_

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record Measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) - Measured by length between the end terminals along centerline of wire as installed.

---

Spec. No.: 2550  
Contract Items: Traffic Management System  
\_\_\_\_\_ System  
Systems Integration

Unit - U.S.: L. S.  
Unit - Metric: L. S.

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Documentation: Record on the I.R.A. as a decimal for Partial Estimate.  
For the Final, submit the I.R.A. as Source  
Documentation.

Method of Measurement: Lump Sum - Pay the percent completed on each Partial  
Estimate. Pay 100% of this item upon satisfactory  
completion.

.....  
Spec. No.: 2550 (cont.)  
Contract Items: \_\_\_\_\_ " (mm) Rigid Steel Conduit  
\_\_\_\_\_ "(mm) Pushed Conduit  
\_\_\_\_\_ "(mm) Non-metallic Conduit  
\_\_\_\_\_ Cable \_\_\_\_\_ Pr. No. \_\_\_\_\_  
\_\_\_\_\_ Cable \_\_\_\_\_ Conductor No. \_\_\_\_\_  
\_\_\_\_\_ Cable \_\_\_\_\_  
Fiber optic Trunk Cable \_\_\_\_\_ MM \_\_\_\_\_ SM

Unit - U.S.: L. F.  
Unit - Metric: (Meter)

Documentation: Record measurements. For the Final, submit these  
records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (meter) - Measured by length between the  
end terminals along centerline of wire as installed.

.....  
Spec. No.: 2550 (cont.)  
Contract Items: \_\_\_\_\_ Foundation  
Handhole, Type \_\_\_\_\_  
Junction Box  
Fiber optic Pigtail  
Fiber optic Splice Vault  
Outdoor Fiber Splice Enclosure  
Buried Cable Sign  
Truck Pad  
\_\_\_\_\_ mm X \_\_\_\_\_ mm Loop Detector, Design \_\_\_\_\_  
Loop Detector Splice  
  
Ramp Control Signal, Design \_\_\_\_\_  
Flasher Signal  
Lane Control Signal  
Closed Circuit Television Assembly  
Changeable Message Sign, Design \_\_\_\_\_

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\_\_\_\_\_ Cabinet  
Service Installation  
Loop Detector Module  
Controller  
\_\_\_\_\_ Multiplexer  
\_\_\_\_\_ Demultiplexer  
\_\_\_\_\_ Range Video Transmitter  
\_\_\_\_\_ Range Video Receiver

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2554  
Contract Items: Traffic Barrier, Design \_\_\_\_\_  
Install Traffic Barrier, Design \_\_\_\_\_  
Permanent Barricades

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) - Barriers of each design designation will be measured by length, to the nearest 0.3 m, between center of end posts continuous in each section. Barricades measured, by length to the nearest 0.3 m, from end to end of planks of each unit.

.....

Spec. No.: 2554 (cont.)  
Contract Items: Guide Post, Type \_\_\_\_\_  
Install Guide Post, Type \_\_\_\_\_  
Anchorage Assembly  
End Treatment- \_\_\_\_\_

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

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Method of Measurement: Unit - Physical count.

---

Spec. No.: 2557  
Contract Items: Wire Fence, Design \_\_\_\_\_  
Metal Post Extensions

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (*meter*) - Measure along the bottom of the fence between end posts. Gates excluded.

Metal Post Extensions are determined as the difference between the standard post length and the actual post length as installed.

.....

Spec. No.: 2557 (cont.)  
Contract Items: Pedestrian Gate  
Vehicular Gate  
Wood Brace Assembly  
Electrical Ground  
Metal Brace Assembly  
Metal Brace Assembly (Chain Link Fence)  
Electrical Ground

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2560  
Contract Items: Highway-Railroad Grade Crossing Signal System

Unit - U.S.: L. S.

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Unit - Metric: L. S.

Documentation: Record on the I.R.A. as a decimal for the Partial Estimate. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump Sum - Pay the percent completed on each Partial Estimate. Pay 100% of this item upon satisfactory completion.

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Spec. No.: 2564  
Contract Items: Traffic Signs & Devices  
Saw Sign Panel Type \_\_\_\_\_

Unit -U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (meter) - Sawing will be measured by the length of the saw cut.

.....  
Spec. No.: 2564 (cont.)  
Contract Items: Concrete Footings - Type

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record dimensions and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Use staked dimensions, include mortis used for capping the footings. Compute to the closest 0. 1 C.Y (0. 1 m

.....  
Spec. No.: 2564 (cont.)  
Contract Items: Median Barrier Footing  
Sign Support  
Modify Post  
Install Sign Panel Type \_\_\_\_\_  
Install Sign Type \_\_\_\_\_  
Sign Legend Revision  
OH Sign Identification Plate



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Extend Walkway Support  
Friction Fuse  
Keeper Plate  
Delineator, Type \_\_\_\_\_  
Reference Post Marker  
Clearance Marker X4-4  
Snowplow Marker X4-5  
End of Roadway Marker X4-11

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

.....  
Spec. No.: 2564 (cont.)  
Contract Items: Traffic Control

Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record on the I.R.A. as a decimal for Partial Estimate. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump-Sum - Pay the percent completed in each Partial Estimate. Pay 100% when all work has been completed and accepted.

.....  
Spec. No.: 2564 (cont.)  
Contract Items: Overhead Sign Structure Repair

Unit - U.S.: Man-Hour  
Unit - Metric: Man-Hour

Documentation: Record the hours on Form 2137. For the Final, submit these forms in booklet or folder form, with proper reference on the I.R.A.

Method of Measurement: Miscellaneous - Measure the actual number of man-hours required to complete the repair, including

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use and operation of equipment, travel time within the project limits, and work and materials involved. Crane work and materials required to position and block the truss up off the ground are incidental.

.....

Spec. No.: 2564 (cont.)  
Contract Items: Structural Steel - (Specify Item and Use)

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record Structural Metals Engineer's quantities on the I.R.A. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Miscellaneous - Contractor will furnish physical properties to Structural Metals Engineer.

.....

Spec. No.: 2564 (cont.)  
Contract Items: Structural Steel - (Specify Item and Use)

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation)-The computed mass will be based on the quantity tables included in the plans.

.....

Spec. No.: 2564 (cont.)  
Contract Items: Structural Steel - (Specify Item and Use)

Unit - U.S.: Lb.  
Unit - Metric: (Kilogram)

Documentation: Record weights. For the Final, submit the tickets with proper reference on the I.R.A.

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Method of Measurement: Weight (Mass) (Scale) - Weigh on approved scale. If weighed by other than state scale man, the mass must be certified.

.....

Spec. No.: 2564 (cont.)  
Contract Items: Sign Panels, Type \_\_\_\_\_  
Furnish Sign Panels, Type \_\_\_\_\_  
Sign Panel Overlay Type \_\_\_\_\_

Unit - U.S.: S.F.  
Unit - Metric: (*Square Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measurements and computations are based on nominal dimensions. Stop signs are to be considered rectangular. Yield signs are to be considered equilateral triangles. No deduction for round comers.

---

Spec. No.: 2565  
Contract Items: Full-Traffic-Actuated Traffic Control Signal System  
Semi-Traffic-Actuated Traffic Control Signal System  
Fixed-time Traffic Control Signal System  
Traffic Control Signals System (2005)

Unit - U.S.: System  
Unit - Metric: System

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

---

Spec. No.: 2571  
Plant Installation

Contract Items: Coniferous, Deciduous or Ornamental \_\_\_\_\_  
(Size and root category)  
Vine or Perennial (Age or size and root category)  
Transplant Tree (spade size)

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Transplant Shrub, Vine or Perennial

Unit - U.S.: Tree, Shrub, Vine, Plant  
Unit - Metric: Tree, Shrub, Vine, Plant

Documentation: Record physical count. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

*Note: State Root Category: Seedling, bare root, machine moved, container grown, or balled and burlapped*

---

Spec No. 2572  
Contract Items: Temporary Fence  
Clean Root Cutting

Unit - U.S.: L.F.  
Unit - Metric: (Meter)

Documentation: Record location and measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Feet (meter) -Measure along the bottom of the fence between end posts for the fence placed, maintained, and removed.

.....  
Spec No. 2572 (cont)  
Contract Items: Water

Unit - U.S.: Gal  
Unit - Metric: (liter)

Documentation: Record on Form 21236. For the Final, submit these forms with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure - Measure each load by sticking, by weight or by calibrated meter. When a municipal meter is used, a certificate from the municipal officer is acceptable.

.....  
Spec. No.: 2572 (cont.)  
Contract Items: Sandy Loam Fill

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Unit - U.S.: C. Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Computations will be based on compacted volume furnished and placed as designated by the Engineer.

*Note: If no bid item is provided for the following protection and restoration of vegetation items, back sheet items must be created and paid for at the indicated unit prices: Temporary Fence at \$2.50 per linear foot (\$8.00 per m); Clean Root Cutting at \$3.50 per linear foot (\$11.50 per m); Water at \$3.00 per 100 gallons (\$8.00 per m<sup>3</sup>); Sandy Loam Fill at \$7.50 per cubic yard (\$10.00 per m<sup>3</sup>); and Prune Trees at \$75.00 per hour.*

---

Spec. No.: 2573  
Contract Items: Silt Fence, Type \_\_\_\_\_  
Bale Barrier  
Temporary Pipe Down drain  
Floatation Silt Curtain, Type \_\_\_\_\_  
Temporary Ditch Check, Type \_\_\_\_\_  
Filter Log, Type \_\_\_\_\_

Unit - U.S.: L.F.  
Unit - Metric: (Meter)

Documentation: Record location and length. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Foot (meter) - Measure along the base of the fence from outside to outside of the end posts for each section of fence. Measure down drain or Curtain length furnished and acceptably installed.

*Note: If no bid item is provided for the following temporary erosion control items, back sheet items must be created and paid for at the indicated unit prices: Bale Barrier at \$1.85 per linear foot (\$6.00 per m); Silt Fence Heavy*

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*Duty (without maintenance) at \$3.00 per linear foot (\$10.00 per m); Silt Fence, type Machine Sliced at \$2.00 per linear foot (\$6.50 per m); Floation Silt Curtain, Type: Still Water, 4 foot (1.2 m) depth at \$16.00 per linear foot (\$52.00 per m); Filter Log, Type Straw Biolog at \$1.00 per linear foot (\$3.00 per m); Filter Log, Type Rock Log at \$0.55 per linear foot (\$1.80 per m.)*

.....  
Spec. No.: 2573 (cont.)  
Contract Items: Sediment Trap Excavation

Unit - U.S.: C.Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit the x-section books and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

Method of Measurement: Cross Section Measure (EV Excavated Volume) – Compute volume using the average-end area method of material in its original position. Sediment removed will be measured and added to the quantity of excavation.

*Note: If no bid item is provided for Sediment Trap Excavation, a back sheet item must be created and paid for at the unit price of \$3.00 per cubic yard (\$4.00 per m<sup>3</sup>).*

.....  
Spec. No.: 2573 (cont.)  
Contract Items: Diversion Mound

Unit - U.S.: C. Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record x-section notes in x-section book. Plot areas and show volume computations on x-section rolls. For the Final, submit the x-section books and rolls with proper reference on the I.R.A. See Records to be submitted in section .510.

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Method of Measurement: Cross Section Measure (CV Compacted Volume) –  
Compacted volume will be determined by cross-section  
measure of the material in its final configuration.

.....  
Spec. No.: 2573 (cont.)  
Contract Items: Sandbag Barrier  
Sediment Mats

Unit - U.S.: S.F.  
Unit - Metric: (Square Meter)

Documentation: Record measurements and computations. For the Final,  
submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure surface area acceptably  
installed based on actual measurement taken along the  
length of the barrier times its height. When more than  
one thickness of bays is installed, the surface area of  
each layer of thickness will be measured and added to  
the quantity. Sediment mats will be measured by the  
area furnished and acceptably installed.

*Note: (2000 Spec) If no bid item is provided for the following  
temporary erosion control items, back sheet items must  
be created and paid for at the indicated unit prices.  
Additional Tillage ordered by the Engineer prior to  
seeding interim mulched areas will be paid for at the  
same unit price as disk anchoring, Disk Anchoring at  
\$27.00 per acre (\$67.00 per ha).*

.....  
Spec. No.: 2573 (cont.)  
Contract Items: Bituminous Lined Flume

Unit -U.S.: S.Y.  
Unit - Metric: (Square Meter)

Documentation: Record measurements and computations. For the Final,  
submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure on the basis of actual  
surface dimensions as placed without regard to  
bituminous mixture used or number of courses placed.

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Any damaged areas restored, by order of the Engineer, will be added to the original quantity.

*Note: If no bid item is provided for Bituminous Lined Flume, a back sheet item must be created and paid for at the unit price of \$5.00 per square yard (\$6.00 per m2)*

.....

Spec. No.: 2573 (cont.)  
Contract Items: Bale Check (2000 Spec)  
Riser Standpipe (2000 Spec)  
Storm Drain Inlet Protection (2005 Spec)  
Flocculant Sock (2005 Spec)

Unit - U.S.: Each  
Unit - Metric: Each

Documentation: Record physical count and location. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Unit - Physical count.

*Note: If no bid item is provided for the following temporary erosion control items, back sheet items must be created and paid for at the indicated unit prices.  
(2000 Spec) Bale Check at \$5.50 per bale.  
(2005 Spec) Flocculant Sock at \$200 each.*

.....

Spec. No.: 2573 (cont.)  
Contract Items: Sediment Removal, Backhoe

Unit - U.S.: Hour  
Unit - Metric: Hour

Documentation: Record equipment hours on Form 2137. For the Final, submit these forms in booklet or folder form, with proper reference on the I.R.A.

Method of Measurement: Miscellaneous - Measured by the number of hours of actual equipment working time and necessary traveling time within the project limits.



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*Note:* If no bid item is provided for the Sediment Removal, Backhoe a back sheet item must be created and paid for at the unit price of \$120.00 per hour. (2005 Spec)

.....

Spec. No: 2573 (cont.)

*Note:* (2000 Spec) If no bid item is provided for Temporary Seed Mixture a back sheet item must be created and paid for at the price of:

Type 100-110B @ \$0.20 per pound (\$0.44 per kg)

Type 120B @ \$2.75 per pound (\$6.00 per kg)

Type 125B @ \$3.75 per pound (\$8.25 per kg)

Type 130B @ \$0.50 per pound (\$0.90 per kg)

The Documentation and the Method of Measurement will be based on a like item found in this manual.

---

Spec. No.: 2575  
Contract Items: Seeding  
Disk Anchoring  
Mowing  
Weed Spraying  
Rapid Stabilization Method 1 or 2

Unit - U.S.: Acre  
Unit - Metric: (Hectare)

Documentation: Record dimensions and computations for the accepted areas. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute accepted areas. Areas reseeded by order of the Engineer, after the original seeding of the area was accepted, will be measured and added to the area originally seeded.

*Note:* (2005 Spec) If no bid item is provided for the following items, a back sheet item must be created and paid for at the price of:

Rapid Stabiliation, Method 1 at \$400.00 per acre (\$900

per ha); Rapid Stabilization, Method 2 at \$500 per acre

(\$1235 per ha); Disk Anchoring at \$30 per acre (\$75 per

ha)

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.....

Spec. No.: 2575 (cont.)

Contract Items: Sodding Type \_\_\_\_\_  
Polypropylene Plastic Netting (2000 Spec)  
Erosion Control Netting (2005 spec)  
Erosion Stabilization Mat, Class \_\_\_\_\_ (2005 Spec)  
Wood Fiber Blanket, Type \_\_\_\_\_  
Erosion Control Blankets, Category \_\_\_\_\_  
Erosion Stabilization Blanket, Type \_\_\_\_\_  
Hydraulic Soil Stabilizer, Type 1 (2005 Spec)  
Rapid Stabilization Method 4 (2005 Spec)

Unit - U. S.: S. Y.

Unit - Metric: *(Square Meter)*

Documentation: Record dimensions and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute accepted areas. Sodded areas covered in uniform strips may be determined from the number of strips placed times the strip dimensions. Where sod is placed shingle style in waterways, the product of the sod strip width and the number of strips placed will be used as the measurement. Areas recovered by order of the Engineer will be added to the original quantity.

Note: *(2005 Spec) If no bid item is provided for the following items, a back sheet item must be created and paid for at the price of:  
Rapid Stabilization, Method 4 at \$2.50 per SY (\$3.00 per m<sup>2</sup>); Erosion Control Blanket Category 4 at \$2.00 per sy (\$2.20 per m<sup>2</sup>).*

---

.....

Spec. No.: 2575 (cont.)

Contract Items: Seed, Mixture \_\_\_\_\_, or (Species)  
Fertilizer, Type \_\_\_\_\_  
Hydraulic Soil Stabilizer, Type \_\_\_\_\_

Unit - U.S.: Lb.

Unit - Metric: *(Kilogram)*

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Documentation: Sack Method - Record the computations, utilizing the commercial tickets attached to the package or the weights printed on the package.

Invoice Documentation - Record the number of containers on the Invoice and initial.  
For the Final, submit the computations or invoices, whichever is most appropriate, with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation, Sack) - Count the number of sacks used and multiply by the mass per sack.

Weight (Mass) (By Computation, Invoice)- Check off all the material delivered against that shown on the supplier's invoice.

In either case, material used in re-doing areas by order of the Engineer, after the original area was accepted, will be added to the original quantities.

*Note: (2005 Spec) If no bid item is provided for Temporary Seed Mixture a back sheet item must be created and paid for at the price of:*  
*Type 100-110 @ \$0.20 per pound (\$0.44 per kg)*  
*Type 150 @ \$1.35 per pound (\$3.00 per kg)*  
*Type 190 @ \$1.25 per pound (\$2.75 per kg)*

.....  
Spec. No.: 2575 (cont.)  
Contract Items: Seed, Mixture \_\_\_\_\_, or (Species)  
Mulch Material, Type \_\_\_\_\_

Unit - U.S.: Lb./Ton  
Unit - Metric: (Kilogram)

Documentation: Bulk Method  
(1) Record on Form 2177  
(2) Record the mass from the commercial delivery ticket.

For the Final, submit the above applicable records with proper reference on the I.R.A.

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Method of Measurement: Weight (Mass) (Scale) - use (1) or (2), whichever method is most appropriate.

(1) Weigh on approved scales.

(2) Use the mass from the manufacturer's Bill of Lading or approved commercial delivery tickets. Material used in re-doing areas by order of the Engineer, after the original area was accepted, will be added to the original quantities.

.....  
Spec. No.: 2575 (cont.)  
Contract Items: Mulch Material, Type \_\_\_\_\_

Unit - U. S.: Ton  
Unit - Metric: (*Metric Ton*)

Documentation: Bale Method - Record the computations, utilizing either the commercial tickets attached to the package, or the nor mass printed on the package. For the Final, submit the computations with the tickets (or bag fronts) with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (By Computation) - Count the number of bales used and multiply by the nominal mass per bali in re-doing areas by order of the Engineer, after the original area was accepted, will be added to the original quantity.

.....  
Spec. No.: 2575 (cont.)  
Contract Items: Mulch Material, Type \_\_\_\_\_

Unit - U.S.: Gal.  
Unit - Metric: (*Liter*)

Documentation: Record on Form 21841. For the Final, submit these forms in booklet or packet form with proper reference on the 1.1

Method of Measurement: Volumetric Measure (Liquid) - Measure each load by sticking, by weight or by calibrated meter, convert to liquid 60° F (15° C. Re-doing of initially accepted areas, by order of the Engineer, will be added to original quantity.

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Spec. No.: 2575 (cont.)  
Contract Items: Mulch Material, Type \_\_\_\_\_

Unit - U.S.: C. Y.  
Unit - Metric: (Cubic Meter)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the loads used on Form 28226- For the Final, submit these forms in booklet or folder form with proper reference on the I.R.A.

Method of Measurement: Vehicular Measure - Compute vehicle capacities to closest 0.1 C.Y. (0.1 m<sup>3</sup>) Round total for each area to the closest C. Y. (M) per day. Re-doing of initially accepted areas, by order of the Engineer, will be added to original quantity.

---

Spec. No.: 2575 (cont.)  
Contract Items: Water

Unit - U.S.: 1000 (M) Gal.  
Unit - Metric: (Cubic Meter)

Documentation: Record on Form 21236. For the Final, submit these forms in booklet or packet form with proper reference on the 1.

Method of Measurement: Volumetric Measure (Liquid) - Load-Count Method – Measure and compute tank capacities to the closest 100 gallons (0.4 m<sup>3</sup>) and count the number of loads used.  
Meter Method. Use calibrated meter, and modify Form 21236 to show beginning and ending reading. When a municipal meter is used, a certificate from the municipal officer is acceptable. Computations can be based on the cubic foot ca 7.481 gallon per cubic feet the net density of the water, at 8.345 lbs. per gallon (1.0 kg /L).

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Spec. No.: 2575 (cont.)  
Contract Items: Rapid Stabilization Method 3

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Unit - U.S.: 1000 (M) Gal.  
Unit - Metric: (Cubic Meter)

Documentation: Record on Form 21236. For the Final, submit these forms in booklet or packet form with proper reference on the 1.

Method of Measurement: Volumetric Measure (Liquid) - Load-Count Method – Measure and compute tank capacities to the closest 100 gallons (0.4 m<sup>3</sup>) and count the number of loads used.

Note: (2005 Spec) If no bid item is provided for Rapid Stabilization, Method 3, a back sheet item must be created and paid for at the price of \$325 per MGAL (\$86 per m<sup>3</sup>)

.....  
Spec. No.: 2575 (cont.)  
Contract Items: Commercial Fertilizer, Analysis  
Agricultural Lime  
Compost, Grade I  
Rapid Stabilization Method 5

Unit - U.S.: Ton/Lb.  
Unit - Metric: (Metric Ton)

Documentation: Bulk Method

- (1) Record on Form 2177
- (2) (2) Record the mass from the commercial delivery ticket

For the Final, submit the above applicable records with proper reference on the I.R.A.

Method of Measurement: Weight (Mass) (Scale) - Use (1) or (2) whichever method is most appropriate.  
(1) Weigh on approved scales.  
(2) Use the mass from the manufacturer's Bill of Lading or commercial delivery tickets.

Note: (2005 Spec) If no bid item is provided for Rapid Stabilization, Method 5, a back sheet item must be

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*created and paid for at the price of \$25 per ton (\$27 per metric ton)*

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Spec. No.: 2575 (cont.)  
Contract Items: Weed Spray Mixture

Unit - U.S.: Gal.  
Unit - Metric: (*Liter*)

Documentation: Container Method - Record the computations utilizing the volume printed on drums or pails.  
Invoice Documentation - Record the number of pails or drums acceptably used and compute gallons (*liter*) used on invoice and initial.  
For the Final, submit the computations or invoices. Whichever is most appropriate, with proper reference on the I.R.A.

Method of Measurement: Miscellaneous - Count the number of containers used and multiply by the gallons (*liter*) printed on container.  
Miscellaneous - Use material suppliers invoice, check off all the material acceptably used.

.....  
Spec. No.: 2575 (cont.)  
Contract Items: Compost, Grade 2 (LV)

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record vehicle measurements and volume computations on Form 2141. Record the load-count of material 28226. For the Final, submit the above forms in booklet or folder form, with proper reference on the I.R.A.

Method of Measurement: Vehicular Measure (LV - Loose Volume) - Measure and compute the capacity of the hauling vehicle to the C.Y. (0. 1 M) Round the total for each area to the closest C. Y. (M) per day.

.....  
Spec. No.: 2575 (cont.)  
Contract Items: Turf Establishment

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Unit - U.S.: L. S.  
Unit - Metric: L. S.

Documentation: Record on the I.R.A. as a decimal for the Partial Estimate. For the Final, submit the I.R.A. as Source Documentation.

Method of Measurement: Lump Sum - Pay the percent completed on each Partial Estimate. Pay 100% of this item upon satisfactory comp

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Spec. No.: 2577  
Contract Items: Soil Bioengineered Systems  
Wattling  
Brush Layering  
Fiber Log

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Feet (meter) - Measure length of work actually performed.

Spec. No.: 2577 (Cont)  
Contract Items: Granular Channel Liner

Unit - U.S.: C.Y.  
Unit - Metric: (*Cubic Meter*)

Documentation: Record three dimensional sketches, measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Volumetric Measure (By Computation) - Measure length, width and depth, and compute volume.

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## CONTRACT ADMINISTRATION MANUAL

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Spec. No.: 2577 (Cont)  
Contract Items: Live Stakes  
Concrete Armor Units (Specify Size)

Unit - U.S.: Each  
Unit - Metric: (*Each*)

Documentation: Record physical count. For the Final, submit these records with proper reference on I.R.A. On small projects, concrete armor units will be accepted by the number of complete units (two individual halves) assembled and installed.

Method of Measurement: Unit - Physical count.

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Spec. No.: 2577 (Cont)  
Contract Items: Concrete Armor Units (Specify Size)

Unit - U.S.: S. Y.  
Unit - Metric: (*Square Meter*)

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute surface area covered by each size. The outermost extremity of the units shall be used in the measurement.

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Spec. No.: 2580 (Spec 2000)  
Contract Items: Temporary Lane Marking

Unit - U.S.: L.F. or Road Station  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Feet (meter) - Measure actual length of each line marked. Do not include the gap between the broken lines.

Road Station - Measure length in Road Stations of 100 feet from termini to termini.

# DOCUMENTATION AND METHOD OF MEASUREMENT

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## CONTRACT ADMINISTRATION MANUAL

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Spec. No.: 2581  
Contract Items: Removable Preformed Plastic Pavement  
Marking

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Feet (*meter*) - Measure actual length of each different width, type, etc., of pavement marking furnished, placed and removed as specified.

Broken line will be measured by the actual length of material used and will not include the gap between the broken lines.

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Spec. No.: 2582  
Contract Items: Linear Markings \_\_\_\_\_ inch (mm) width (1)(2)(3)

Unit - U.S.: L. F.  
Unit - Metric: (*Meter*)

Documentation: Record measurements. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Linear Feet (*meter*) - Measure actual length of each different width, type, etc., of pavement marking furnished and placed as specified.

Broken line will be measured by the actual length of material used and will not include the gap between the broken lines.

Note: (1) Specify Material  
(2) Specify Type of Line (Solid, Broken or Dotted)  
(3) Specify Color

.....  
Spec. No.: 2582  
Contract Items: Pavement Message (1) (2)

# DOCUMENTATION AND METHOD OF MEASUREMENT

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## CONTRACT ADMINISTRATION MANUAL

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Unit - U.S.: Each  
Unit - Metric: *Each*

Documentation: Record physical count. For the Final, submit these records with proper reference on I.R.A.

Method of Measurement: Unit - Physical count.

Note: (1) Specify Message  
(2) Specify Material

.....

Spec. No.: 2582  
Contract Items: Crosswalks (Specify Material)

Unit - U.S.: S.F.  
Unit - Metric: *(Square Meter)*

Documentation: Record measurements and computations. For the Final, submit these records with proper reference on the I.R.A.

Method of Measurement: Area Computation - Measure and compute the area of the front face of wall, based on actual completed dimensions.

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**DOCUMENTATION AND METHOD OF MEASUREMENT**  
**5-591.420 CONTRACT ADMINISTRATION MANUAL**

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**FORMS REQUIREMENTS**

The following Mn/DOT forms required by section 5-591.420 are available on the Website @ <http://www.dot.state.mn.us/const/tools/forms.html>

Form 28233	Daily Accomplishment Report
Form 2137	Daily Equipment Labor Rental Record
Form 2158	Ready Mix Concrete Batch Ticket
Form 2141	Computation of Truck Box Capacities
Form 2210	Pile Driving Report
Form 2264	Test Pile Report
Form 17119	Inventory of Salvage Bridge Material
Form 21236	Daily Water Report
Form 21841	Bituminous Application Record
Form 2190	Earthwork Computations
Form 2460	Work Order for Minor Extra Work
Form 2134	Supplemental Agreement –Regular Form
Form 2134	Supplemental Agreement – Part “A”
Form 2134	Supplemental Agreement – Part “B”
Form 2460	Change Order Form
Form 21659	Summary of Daily Force Account
Form 2119	Change in Contract Construction Status