
ROADWAY EXCAVATION AND GRADING

PART 1 GENERAL

- 1.01 OTHER CONTRACT DOCUMENTS The General Conditions of the Contract, General Requirements and Supplemental Conditions attached hereto shall apply to and be a part of this Section.
- 1.02 DESCRIPTION OF WORK The Work described herein shall be for the removal of and the supply and installation of all materials necessary for the construction of roadways, lanes, concrete works, embankments, drainage works, borrow areas and other related Work requiring the excavation of material.
- 1.03 RELATED WORK Section 02303 Granular Base Course
Section 02305 Soil Cement Base Course
Section 02510 Plant Mixed Bituminous Pavement
Section 02514 Concrete Construction
- 1.04 CLASSIFICATION OF THE WORK Excavation shall be classified as either Common, Rock or Borrow. Unless specified otherwise in Section 01001 Supplemental Conditions or shown on the Drawings, Excavation shall be Common.
- 1.05 QUALITY ASSURANCE The Engineer will make density analysis to ASTM D698 and ASTM D2922 test procedures to determine the acceptability of the sub-grade and each layer of material placed and compacted by the Contractor. Testing will be carried out prior to any succeeding layer of material being placed by the Contractor.
The analysis and approval of materials by the City will not relieve the Contractor from his duty to produce an acceptable product as stated in this Section.

PART 2 PRODUCTS

- 2.01 COMMON EXCAVATION Common Excavation shall include all excavation through frozen or unfrozen clay, silt, sand, gravel, hard-pan, dense tills, earth, roots, rubbish, quick-sand, rubble, water, ice, snow, shale, cobbles, boulders (less than one cubic metre in volume), loose rock, surface or buried asphalt and concrete pavements, concrete rubble, existing underground and surface utilities and any other obstacle which may be encountered excepting Rock Excavation as defined herein.

ROADWAY EXCAVATION AND GRADING

2.02 ROCK EXCAVATION Rock Excavation shall include individual boulders, rock fragments, pieces of concrete, or masonry exceeding one (1.0) cubic metre in volume or solid ledge rock, bedrock, concrete or masonry which can not be removed by excavation equipment without drilling, splitting, breaking, or blasting. No soft or disintegrated rock, concrete or masonry removed with a hand pick, shovel, or excavation equipment, or loose, shaken or previously blasted rock will be included as Rock Excavation

2.03 BORROW
EXCAVATION Borrow Excavation shall include the excavation, transportation and placing at the Site, material obtained from designated locations outside the limit of the work. Borrow material shall consist of low to medium plastic clays or uniform mixtures of sand and clay. The Borrow material shall be free of wood, vegetation, concrete rubble or stones larger than 25 millimetres in greatest diameter.

PART 3 EXECUTION

3.01 CLEARING THE
RIGHT OF WAY The Contractor shall clear the municipal road and/or easement right of way of vegetation, brush, and rubbish to the limits shown on the Drawings or set out on the Site by the Engineer. Only trees marked for removal shall be cut down, and all stumps or roots larger than 200 millimetres in diameter shall be excavated and removed from the Site. Branches from trees located on private property which extend into the municipal right of way shall be cleanly cut, the cut treated and the branch removed from the Site. Movable items (mail boxes, signs, benches) shall be temporarily relocated or removed from the Site as directed by the Engineer. Any structure (wood pole, shed, fence, garage, etc) which is partly or wholly within the municipal right of way or on private property but obstructing the Work, shall not be removed without the written authorization of the Engineer.

3.02 TOPSOIL REMOVAL If directed by the Engineer, the Contractor shall remove and stockpile topsoil for reuse. The topsoil shall be removed when dry enough to prevent any contamination with the subsoil material. The Contractor shall not mix grass, weeds, roots, brush or stones larger than 75 millimetres with the stockpiled topsoil.

ROADWAY EXCAVATION AND GRADING

3.03 DRAINAGE

The Work shall be constructed and maintained so it is well drained and free of water at all times. The Contractor shall take all necessary precautions to preserve and protect existing drains, surface drainage ditches, culverts, sewers or other facilities which may be affected by his operations. The Contractor will be liable for any and all damage which results from the blockage or damage to a drain.

The Contractor shall supply and maintain, at his own expense, all necessary portable drainage equipment (including power, pumps, sand points and discharge hose) to keep all excavations free of water at all times. De-watering shall be carried out by methods approved by the Engineer, and shall not interfere with the Work, damage property or harm the environment. Water shall not be disposed of in a municipal sewer or drain unless authorized by the Engineer.

3.04 CULVERTS

The Contractor shall remove, store and prior to the completion of the Work, install each culvert at the location shown on the Drawings or set out on the Site by the Engineer.

If, in the opinion of the Engineer, the existing culvert can not be salvaged, the Contractor shall remove and dispose of the culvert and install a new culvert in place of the original. Unless stated otherwise in Section 01001 Supplemental Conditions, shown on the Drawings, or listed in the Unit Price Schedule, the supply of the new culvert will be by the City unless the Engineer requests the new culvert be supplied by the Contractor, then payment will be as Additional Work in accordance with the General Conditions of the Contract attached hereto.

3.05 ROADWAY
EXCAVATION

The Contractor shall excavate the roadway to the elevation and alignment shown on the Drawings and as set out on the Site by the Engineer.

Prior to any excavation the Contractor shall neatly saw cut existing oiled surfaces, asphalt or concrete at the limit of excavation show on the Drawings or set out on the Site by the Engineer. Saw cuts shall be vertical and through the full depth or the pavement or concrete. The Contractor shall break the pavement or concrete from around existing curb stops, street hardware, street lights and water valves by hand methods.

ROADWAY EXCAVATION AND GRADING

Gravel from existing lanes and driveways shall be removed and stockpiled.

The Contractor shall excavate and remove the existing pavement, concrete and in situ material to the sub-grade elevation of the roadway, concrete work or landscaping in a manner which will not damage adjacent works designated to remain in place. Saw cut pavement and concrete shall break along straight lines. Vertical variance from grade shall not exceed 25 millimetres and horizontal variance from grade shall not exceed 100 millimetres.

The Contractor shall excavate the in situ material in a manner which enables the Engineer to inspect the separation of materials and determine which materials are to be disposed of and which materials are to be salvaged and stockpiled on the Site for incorporation into the Work. Salvaged material shall be piled and stored in manner that does not endanger the Work or obstruct roads, surface drainage, sidewalks, driveways, hydrants and control devices. The Contractor shall dispose of all surplus and unsuitable material as stated in Section 01710 Cleanup.

The excavation shall not extend beyond the staked limit of excavation unless directed otherwise by the Engineer and any pavement, concrete or in situ material damaged or removed beyond the marked limit of the Work shall be replaced with approved fill material, by the Contractor, at his sole expense.

**3.06 UNSUITABLE
SUB-GRADE**

The Contractor shall notify the Engineer of any unsuitable sub-grade conditions (organics, silt pockets, rubbish) and discontinue the Work in the area until the Engineer has determined the extent of the problem. If the Engineer determines the sub-grade material is unstable or contains unsuitable material, the Contractor shall extend the excavation to the lower level of the unsuitable material or a depth as directed by the Engineer. He shall then replace the unsuitable material with approved fill material compacted to the correct shape and elevation as set on the Site by the Engineer. Payment for the removal of unsuitable sub-grade will be at the Unit Price shown in the Unit Price Schedule for the type and class of fill material used or as Additional Work as stated in the Contract Documents.

ROADWAY EXCAVATION AND GRADING

The Engineer may request the Contractor supply and install a geotextile fabric. The supply and installation of a Geotextile Fabric shall be as stated in Section 02575 Geotextiles, or as directed by the Engineer. Payment for this Work will be at the Unit Price shown in the Unit Price Schedule for the type and class of material used or as Additional Work as stated in the Contract Documents

3.07 SUB-GRADE
PREPARATION

The sub-grade shall be prepared for a minimum distance of one block in advance of the placing of the base course granular material. The excavated sub-grade or bottom of the excavation shall be a level, firm, undisturbed surface, free of loose, soft or organic matter and shaped to the cross section and elevation shown on the Drawings or as set out on the Site by the Engineer. Sub-grade material shall be compacted at the optimum moisture content or at a maximum of 2% above the optimum moisture content.

The Contractor shall take all necessary precautions to protect the sub-grade from excess water. If excess water has collected on the sub-grade, to cause local or continuous ponding, no additional compaction will be permitted until sufficient drying has occurred, and conditions are suitable for continued compacting operations. The completed sub-grade shall have a smooth firm surface, free from ruts, waves, undulations. If the bottom of the excavation is disturbed or damaged as a result of the Contractor's excavation, base material installation and compaction methods, he shall, at his sole expense, carry out any further excavation and compaction as the Engineer may require

3.08 DRAIN EXCAVATION

Ditches, channels and waterways shall be excavated to the elevation, cross section and alignment shown on the Drawings or as set out on the Site by the Engineer. The bottom and sides of the excavation shall be firm undisturbed soil, free of loose, soft or organic matter. Roots, stumps or other unsuitable shall be removed and the excavation filled and compacted with approved fill material Vertical variance from grade shall not exceed 25 millimetres and horizontal variance from grade shall not exceed 100 millimetres. The excavation shall not extend beyond the marked limit of excavation unless otherwise permitted by the Engineer. Any excavation beyond

ROADWAY EXCAVATION AND GRADING

the limit of excavation not requested by the Engineer shall be filled with approved compacted fill material at the Contractor's sole expense.

Unless stated otherwise in Section 01001 Supplemental Provisions, or directed otherwise by the Engineer, Contractor shall dispose of all surplus and unsuitable material as stated in Section 01710 Cleanup. If directed by the Engineer, surplus excavated material shall be spread in thin, uniform layers, and not deposited within one (1) metre of the top of the ditch or channel embankment. Final grading of the ditch or channel bottom and embankments shall be as described in Part 3.11 of this Section.

3.09 BORROW
EXCAVATION

The borrow area will be provided at the City's cost. The Contractor shall give the Engineer sufficient notification in advance of commencing the Work to allow for preliminary volume measurement of the borrow area. Material excavated from the borrow area prior to the Engineer's measurement will not be included for payment.

The Contractor shall construct and maintain all required access roads to the borrow area. The Contractor shall excavate the borrow area to the elevation and limits shown on the Drawings, or as set out on the Site by the Engineer. Material which the Engineer has determined is unsuitable for use in the Work shall be removed from the borrow area and deposited and deposited or stockpiled adjacent to the borrow area. Excavation throughout the borrow area shall be uniform and not below the depth indicated. The sides of the borrow area shall be excavated to a slope no greater than 4 horizontal to 1 vertical.

Upon completion of the Work, The Contractor shall remove all access roads and uniformly distribute all stockpiled unsuitable material over the side slopes and bottom of the borrow area. He shall also trim all slopes to 4 horizontal to 1 vertical. The construction and removal of access roads, trimming and levelling and cleanup of the borrow area will be considered incidental to Borrow Excavation.

ROADWAY EXCAVATION AND GRADING

3.10 EMBANKMENT

Unless stated otherwise in Section 01001 Special Provisions all fill material for embankment construction shall be obtained from the Site. Where there is not sufficient suitable site material available for the embankment construction, approved fill material shall be used. Payment for supply of approved fill material will be at the Unit Price shown in the Unit Price Schedule for the type and class of fill material used or as Additional Work as stated in the Contract Documents.

The Contractor shall excavate and construct the embankment to the elevation, cross section and alignment shown on the Drawings or as set out on the Site by the Engineer. Vertical variance from grade shall not exceed 50 millimetres and horizontal variance from grade shall not exceed 150 millimetres.

When the embankment is to be constructed over an existing road, ditch or other uneven surface, the Contractor shall first level and scarify the existing ground to a depth of 150 millimetres to provide a uniform surface for the placing and compaction of embankment material. The Contractor shall place the embankment material in uniform layers of not more than 200 millimetres in depth over the full width of the cross-section. Material having less than twenty (20%) percent passing the 75 micrometer (75 um) sieve shall, when approved by the Engineer, be placed in uniform layers of not more than 500 millimetres in depth. Non-uniform material, rocks, broken stones or concrete shall be well distributed throughout the embankment, blended into each layer by manipulating the material with a motor grader or other approved equipment and adequately covered with fine material. No bolder, loose rock, or concrete rubble exceeding 150 millimetres in greatest dimension shall be incorporated into the embankment.

Each layer shall be smooth, crowned to permit drainage and compacted to 100% Standard Proctor Density, for roadway embankments and 95% Standard Proctor Density for all other types of embankments. Each layer shall be compacted when the moisture content of the material is in the optimum range. If, in the opinion of the Engineer, the embankment material is too dry to compact, the Contractor shall supply, transport and apply water to assist in obtaining the required density. Water shall be uniformly applied from a water tank and thoroughly

ROADWAY EXCAVATION AND GRADING

mixed with the embankment material. The Contractor may purchase water from the City, and shall arrange with the Engineer for access to a hydrant. If, in the opinion of the Engineer, the embankment material is too wet to compact, the Contractor shall disc or scarify the wet material to reduce the moisture content prior to any further compaction or, at his sole expense, remove and replace the wet material with approved fill material.

In swampy or submerged areas the requirement for layer construction and compaction of the embankment may be waived until the Engineer is satisfied the height of the embankment is sufficient to bear the weight of equipment.

3.11 BACKFILL

The Contractor shall remove and dispose of all debris, stones, rubbish and surplus material from the Site prior to backfilling. The Contractor shall restore ditch and embankment slopes to a condition equal to that prevailing prior to the start of the Work. The Contractor shall bring up and spread any material that may have been pushed down the side slopes during construction.

Final trimming and grading of the ditches and embankments shall include uniformly spreading stockpiled topsoil over the side slopes, ditch bottoms and other areas of the embankment as directed by the Engineer.

END OF SECTION