

**Construction Specification for
General Excavation**

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TS 2.10.01 SCOPE

This specification covers the requirements for general excavation, reuse and disposal of all materials necessary for construction of the earth subgrade to the specified profile and cross-section and for the rehabilitation of roadways, sidewalks, relocation, maintenance and installation of buried utilities, drainage or other reasons as specified in the Contract Documents.

The work shall also include the sloping and shaping necessary to prepare, alter, complete the construction of embankments, shoulders, ditches, boulevards, roadway and driveway intersections to the required alignment, grade and cross-sections shown as on the Contract Plans.

TS 2.10.02 REFERENCES

This specification refers to the following standards, specifications or publications:

City of Toronto Standard Specifications

TS 13.10	Construction Specification for Unshrinkable Fill
TS 206	Amendment to OPSS 206 – Construction Specification for Grading
TS 405	Amendment to OPSS 405 – Construction Specification for Pipe Subdrain
TS 501	Amendment to OPSS.MUNI 501 – Construction Specification for Compacting

City of Toronto Standard Drawing

T-216.02-9	Cross-Section Limits for General Excavation (Payment Purposes Only)
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Ontario Provincial Standard Specifications

OPSS 180	General Specification for the Management of Excess Materials
OPSS.MUNI 212	Construction Specification for Borrow
OPSS.MUNI 510	Construction Specification for Removals

TS 2.10.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Excavation means the removal of all material encountered including rock, rubbish, earth, concrete, asphalt and concrete pavement structure, frozen earth and pipes.

Excess Excavation means all excavation beyond that specified, performed without written order of Contract Administrator.

Earthen Materials shall include unsuitable materials, clays, silts, sands, gravels, pavements, concrete, boulders, rock, and stone.

TS 2.10.04 DESIGN AND SUBMISSION REQUIREMENTS

The Contractor shall provide an environmental assessment report, from a qualified laboratory, attesting to the non-contaminated nature of any imported borrow to be incorporated into the work.

TS 2.10.05 MATERIALS – Not Used

TS 2.10.06 EQUIPMENT – Not Used

TS 2.10.07 CONSTRUCTION

TS 2.10.07.01 General

Excavation consists of the following:

- a) Roadway excavation includes the removal of earthen materials from within the roadway to construct the subgrade, including the removal of unsatisfactory material, to the grade and cross-section as shown on the plans. Excavation shall include for all facilities within the street right-of-way, including the street, sidewalk, curb and gutter, medians, driveways, alleys, easements, landscaping or other surface improvement work. All excavation zones shall be proof rolled, compacted, inspected and approved by the Contract Administrator prior to the placement of any subsequent materials.
- b) Any excavation required to remove temporary ramps, accesses, platforms and footpaths constructed under the maintenance items, which cannot be incorporated into permanent or other temporary construction.
- c) Salvaging, stockpiling and reuse of materials.
- d) Placing and compacting suitable excavated material as fill.
- e) Disposing of surplus and unsuitable materials.
- f) Localized or extended excavation of soft spots and other undesirable material.
- g) Excavation for utility service installation, repair or relocation.

Removal of excavated materials shall be according to OPSS.MUNI 510 or as specified in the Contract Documents. Excavation shall be to the lines and grades shown on the Contract Drawings. Care shall be taken to prevent damage to appurtenances and utilities which may be within the area of excavation.

The Contractor shall make good all damage caused during the course of the work, and return the work to its initial condition, at no extra cost to the City.

TS 2.10.07.02 Existing Underground Utilities

The Contractor shall be responsible for arranging underground locates of all utility assets prior to excavating. The Contractor shall not commence excavation in a location prior to a utility members marking the location of their utilities or indicating that none exist within the excavation limits outlined by the Contractor. Where necessary, the Contractor shall employ the services of a private utility locator to ensure that all utilities are located in a timely manner.

It is the Contractor's responsibility to verify the location and elevation of all existing utilities within the limits of the Work. The Contractor shall observe the locations of the stake outs, prior to commencing the Work, and in the event there is a discrepancy between the locations of the stake outs and the locations shown on the Contract Documents, that may affect the Work, the Contractor shall immediately notify the Contract Administrator and the affected utility companies, in order to resolve the conflict.

All existing buried utilities located within the excavation zone and any other facilities adjacent to the excavation shall be carefully supported and protected from damage as a result of the Contractor's operations. The Contractor shall be responsible for repairing any damaged underground utilities, as a result of the Contractor's actions during the course of the work, and shall do so at no extra cost to the City.

All costs associated with this work shall be considered incidental to all related items of work in the Contract. No separate payment will be made for costs incurred in obtaining utility locates.

TS 2.10.07.03 Shoring, Sheeting and Bracing

The Contractor shall furnish and install the required shoring, sheeting, and bracing and maintain such features to ensure the safety of workers and the public, protect the work, and protect existing facilities during excavation works.

The cost of constructing, maintaining and removing shoring, sheeting and bracing shall be considered as incidental to the construction of the project, and all costs, therefore, shall be included under the item or items for excavation.

TS 2.10.07.04 Excavation Method

The Contractor shall employ such construction methods, plant, procedures and precautions as shall ensure that excavations are stable, free from disturbance and, unless designated as sub-aqueous work.

Methods used in excavation shall be such as not to cause damage to surrounding property or to unnecessarily damage pavement. Mats shall be utilized for backhoe outriggers, track excavators and other equipment to prevent unnecessary damage to paved and unpaved surfaces.

TS 2.10.07.05 Excavating and Subgrade Preparation

All muck, peat and other unsuitable material shall be removed and disposed of off the site. All suitable excavated earthen materials approved by the Contract Administrator, shall be used in the construction of the earth grade and at such other places as shown on the plans of designated by the City. Existing road surfacing or granular base and subbase shall be removed and reused or disposed of.

The maximum amount of approved excavated materials available within the designated areas shall be salvaged. Reasonable care shall be exercised in removing and handling the designated material to prevent incorporation of foreign or undesirable material.

The Contractor shall schedule his operations so that all approved excavated material shall be incorporated directly into the work. Where this is not possible, the Contractor will be required to stockpile these materials within or outside construction limits at locations approved by the Contract Administrator for later inclusion in the work.

If there is an excess of salvaged material above that required in the new construction, the stockpiles of surplus material shall be managed by the Contractor according to OPSS 180.

In all cuts, the subgrade shall be graded, sloped and compacted to not less than 98% of the maximum dry density, according to TS 501, before placing any subsequent subbase or base material. The grading shall be so conducted as to avoid removing or loosening any material outside of the required slopes, and any such material which may be removed or loosened shall be replaced and compacted according to TS 501 and to the required profile and cross-section. All intersecting roads, approaches, entrances and driveways shall be graded as shown on the Contract Plans.

TS 2.10.07.06 Drainage and Dewatering

When either ground water or surface run-off is encountered, the Contractor shall furnish, install, maintain, and operate all necessary pumps, materials and equipment to keep excavation reasonably free from water until the placement of any subsequent material has been completed, inspected and approved.

All pumped or drained water shall be disposed of without undue interference to other work, or causing damage to pavements, other surfaces, or property. Water removed from the excavation shall be disposed of.

The roadbed, trenches and ditches shall be maintained in such condition, that the work will be well drained at all times. If it is necessary during construction to interrupt existing surface drainage, sewers or under-drainage, then temporary drainage facilities shall be provided until the permanent drainage work is completed. No additional payment will be made for this work.

Dewatering and the construction of all temporary drainage facilities shall be considered as incidental to the construction of the project, and all costs, therefore, shall be included under the item or items for excavation.

TS 2.10.07.07 Constructing Ditches and Channels

All suitable and approved materials excavated from ditches and from channel changes shall be used in the construction of earthen grade, or shall be otherwise managed and disposed of according to OPSS 180. No waste or surplus excavation shall be left within one metre from the edge of the ditch or channel. All roots, stumps and other objectionable materials in the slopes and bottom of the ditch shall be removed and the voids backfilled with approved material. All ditches and channels constructed on the project shall be maintained to the required cross-section and shall be kept free from debris until final acceptance.

TS 2.10.07.08 Unauthorized Excavation

When the bottom or sides of any excavation is taken out beyond the limits indicated or specified, the excess excavation shall be backfilled at the Contractor's expense, with Granular A and compacted according to TS 501. In areas that cannot be properly compacted unshrinkable fill shall be used.

TS 2.10.07.09 Backfilling of Over-excavated Areas and Voids

Where voids are encountered or unsuitable material has been excavated below the design grade, the excavation shall be backfilled, to the subgrade level, with material approved by the Contract Administrator and compacted according to TS 501 for the type of material chosen. If the backfill is granular or a non-clay material, the work area shall be fully drained prior to the backfill of the over excavation. Drainage shall be accomplished using 150 mm subdrain to the nearest ditch or catch basin and shall be according to TS 405, or an alternative recommended drainage plan provided by the Contractor and approved by the Contract Administrator.

The Contractor should note that the ditch or storm system may have to be adjusted to facilitate the drainage. No additional payment will be made for this work.

If the excavation cannot be drained in the above manner, the area is to be backfilled to the subgrade level, with unshrinkable fill according to TS 13.10.

TS 2.10.07.10 Disposing of Stones, Broken Rock and Boulders

All stones and boulders occurring within construction limits and all broken rock from rock cuts that are not required for the construction of cobble, gutter, riprap, or like structures, shall be placed in embankments, where possible. The stones, broken rock and boulders shall be placed in layers, and all voids shall be completely filled with sound, clean earth, thoroughly compacted according to TS 501. No layer of such material shall be placed within 300 mm of the surface of the earth grade, or within the limits of assumed 1H:1V slopes spreading outward from lines one metre outside of the edges of the proposed roadway construction such as pavement, interlocking brick, sidewalk and so on.

TS 2.10.07.11 Removal of Maintenance Items

All asphalt, concrete and contaminated granular used in the "Maintenance of Traffic" item(s) shall be excavated and disposed of, off the site.

All other material deemed reusable by the Contract Administrator shall be graded into and form part of the roadway subbase, in which case no allowance or payment will be made for the removal, re-handling and re-compaction of this material.

TS 2.10.07.12 Disposing of Surplus and Unsuitable Material

All suitable surplus excavated material approved by the Contract Administrator, which conforms with the requirements of TS 2.10.07.11, herein, shall be used when directed by the City to uniformly widen embankments, to flatten slopes and to fill low places in the right-of-way. Other suitable material shall be deposited in low places within the right-of-way as approved by the Contract Administrator.

All surplus or unsuitable excavated materials that cannot be used in the above manner shall be disposed of off the site and managed according to OPSS 180. No surplus material shall be placed or stored within the public right of way.

All such removal shall be completed before surfacing operations commences. No re-handling allowance will be made for any surplus material which requires disposal by the Contractor, at an approved offsite waste disposal location.

All excavated material of value to or required by the City, including materials from existing structures such as old lumber, stone flagging, granite blocks, cobble stones, paving brick, sewer or other pipe, sewer brick, maintenance holes or catch basin tops, valves, hydrants, and earth or any other materials, shall be neatly piled, deposited or evenly spread by the Contractor in such place as may be directed by the Contract Administrator. The whole expense including that of hauling, unloading and spreading shall be borne by the Contractor.

TS 2.10.08 QUALITY ASSURANCE

Quality assurance (QA) acceptance testing of the Work shall be conducted by the City's quality assurance consultant. Quality assurance inspection and testing shall include the following:

- a) Visual inspection and witnessing of proof rolling operations to determine soft spots or poor soil support conditions in excavated zones.
- b) Compaction testing according to TS 501.

All defective work areas uncovered through the quality assurance inspection and testing process shall be identified by the consultant to the Contract Administrator and Contractor and shall be immediately corrected by the Contractor. All corrected defect areas shall be inspected and re-tested by the quality assurance consultant.

Prior to leaving the construction site, the quality assurance consultant shall provide a copy of the field inspection and testing report to the Contract Administrator, on completion of the quality assurance inspection or testing. The Contractor may have a representative present during any quality assurance testing. During the quality assurance testing, the representative shall immediately comment on any aspects of the testing which the representative does not consider valid and the Contract Administrator will respond to the comments in order to resolve them. Prior to leaving the quality assurance testing, any unresolved comments regarding the testing procedures are to be given to the Contract Administrator in writing. Any comments on the testing procedures which are made subsequent to the Contractor's representative leaving the tested work zone will not be considered.

TS 2.10.09 MEASUREMENT FOR PAYMENT

**TS 2.10.09.01 General Excavation
 Additional Excavation of Soft Spots**

Measurement shall be by volume in cubic metres (m³). The volume shall be calculated as the difference between cross sections of the original ground and the cross sections of the final finished grade, in areas of cut according to T-216.02-9. The volume of excavated material may be as measured and agreed upon in the field if the average end area is impracticable.

Where a separate item is included for removal of concrete, asphalt, topsoil, sod or other material within the excavation limits, the volume shall not be deducted from measured volume of general excavation. Excavation beyond the lines and grades of the proposed cross sections will be disallowed unless authorized by the Contract Administrator in writing. Field cross sections shall be taken, by the Contractor, to establish the actual lines and grades where they differ from the proposed cross sections.

The volume of surplus of unsuitable material trucked from the site shall be calculated by box measurement only if the average end area is impracticable.

TS 2.10.09.02 Strip Topsoil and Other Material from Ditches and Other Low Areas

Topsoil and other organic materials stripped from ditches and other low areas shall be measured in linear metres (m) parallel to the direction of traffic. The Contractor shall investigate the depth of this material and the width of ditches before bidding on the above item.

TS 2.10.09.03 Place and Compact Approved Material Ditches and Other Low Areas

Approved excavated material from storm sewer and roadway excavations placed and compacted in ditches and other low areas shall be measured in linear metres (m) parallel to the direction of traffic.

TS 2.10.10 BASIS OF PAYMENT

**TS 2.10.10.01 General Excavation – Item
 Additional Excavation of Soft Spots – Item**

Payment at the Contract Price for the above tender item(s) shall be full compensation for all labour, Equipment and Material to do the work. Payment shall include the excavating of all materials encountered, for hauling, stockpiling, trimming, placing and compacting materials suitable for fill, for disposal of surplus or unsuitable materials off the site and all trimming, grading and compaction of the subgrade. Payment shall also include the removal and disposal of all temporary asphalt and contaminated aggregate.

No payment will be made for any and all excavation below the grades shown on the drawings, except where directed by the Contract Administrator in writing.

The cost to excavate and dispose of material to allow for the placement of new granular, concrete, asphalt, topsoil, sod or other material shall be incidental to the associated items. No separate payment shall be made.

TS 2.10.10.02 Strip Topsoil and Other Organic Material from Ditches and Other Low Areas – Item

Payment at the Contract Price for the above tender item shall be full compensation for all labour, Equipment and Material to do the work. Payment shall include the stripping of topsoil and other organic material from the ditches, the stockpiling of reusable material and the disposal off the site of any excess topsoil or other organic material.

TS 2.10.10.03 Place and Compact Approved Material in Ditches and Other Low Areas – Item

Payment at the Contract Price for the above tender item shall be full compensation for all labour, Equipment and Material to do the work. Payment shall include the placing and compacting or approved excavated material in ditches and other low areas.