

**CONSTRUCTION SPECIFICATION FOR
GENERAL EXCAVATION**

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TS 2.10.01 SCOPE

This Specification covers the requirements for the removal and disposal of all materials necessary for construction of the earth subgrade to the specified profile and cross-section.

TS 2.10.02 REFERENCES

This specification refers to the following specifications and publications:

Ontario Provincial Standard Specification, General

OPSS 180 - Management and Disposal and Excess Material
OPSS 212 - Borrow

City of Toronto Specification

TS 13.10 - Specification for Unshrinkable Fill
TS 206 - Amendments to OPSS 206 – Construction Specification for Grading
TS 405 - Amendments to OPSS 405 – Construction Specification for Pipe Subdrains

TS 501 - Amendments to OPSS 501 – Construction Specification for Compacting

TS 2.10.03 DEFINITIONS

For the purposes of this specification the following definitions apply:

Excavation: means the removal of all material encountered including rock, rubbish, earth, concrete, asphalt, pipes, etc., unless otherwise specified in the tender documents.

TS 2.10.04 SUBMISSION AND DESIGN REQUIREMENTS

The contractor shall provide an environmental assessment report, from a qualified laboratory, attesting to the noncontaminated nature of any borrow source.

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

General excavation consists of the following:

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- a) Excavation of all materials necessary for construction of the earth subgrade to the specified profile and cross-section.
 - 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 and stockpiling of all useable materials as directed by the City.
 - d) Grading the roadway, intersections and entrances.
 - e) Placing and compacting excavated material as fill.
 - f) Disposing of surplus and unsuitable materials.
 - g) Maintaining the work in a finished condition until acceptance by the City.
 - h) Localized or extended excavation of soft spots and other undesirable material, as directed by the City.

All material which is surplus or unsuitable shall be managed as specified in OPSS 180.

Grading tolerances for general excavation shall be stated as TS 206.07.01.07.

Excavation shall be to the lines and grades shown on the contract drawings or as specified by the City. Care shall be taken to prevent damage to appurtenances and utilities which may be within the area of excavation.

The Contractor shall make good, at the direction of the City, all damage caused during the course of the work, and return the work to its initial condition.

TS 2.10.07.02 Preparing Roadway Subgrade

All muck, peat and other unsuitable material shall be removed and disposed of off the site, or as directed by the City.

Road surfacing or base of gravel or crushed stone shall be removed and used or disposed of, as directed by the City. The maximum amount of approved 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. When the salvaged material cannot be placed directly in the contemplated construction, the material shall be placed in stockpiles, within the limits of the roadway or outside construction limits, at locations approved by the City. If there is an excess of salvaged material above that required in the new construction, the stockpiles of surplus material shall be trimmed to present a neat appearance or subsequently removed, as directed by the City.

TS 2.10.07.03 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 as per TS 501, but no layer of such material shall be placed within 300mm of the surface of the earth grade, or within the limits of assumed 1:1 slopes spreading outward from lines 1m outside of the edges of the proposed roadway construction (pavement, interlocking brick, sidewalk, etc.).

TS 2.10.07.04 Grading the Roadway, Intersections and Entrances

All suitable excavated materials 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. The Contractor shall schedule his operations so that all suitable 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 City for later inclusion in the work.

The roadbed and ditches shall be maintained in such condition, that the work will be well drained at all times. If it is necessary, in the prosecution of the work, to interrupt existing surface drainage, sewers or under-drainage, then temporary drainage facilities shall be provided until the permanent drainage work is completed. 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.

In all cuts, the subgrade shall be graded, sloped and compacted to not less than 95% of the maximum unit dry weight, as specified in TS 501, before placing subbase 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 thoroughly compacted to the required cross-section. All intersecting roads, approaches, entrances and driveways shall be graded as shown on the plans or as directed by the City.

TS 2.10.07.05 Construction Ditches and Channels

All suitable materials excavated from ditches and from channel changes shall be used in the construction of the roadway, or shall be otherwise disposed of as directed by the City. No waste or surplus excavation shall be left within 1m from the edge of the ditch or channel. Any such surplus or waste material shall be spread in a thin uniform layer. All roots, stumps and other objectionable materials in the slopes and bottom of the ditch shall be removed and holes backfilled with suitable 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 2.10.07.06 Removal of Maintenance Items

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

All material deemed reusable by the City shall be graded into and form part of the roadway subbase, in which case no allowance or payment will be made for the removal, rehandling and recompaction of this material.

TS 2.10.07.07 Placing Fill

TS 2.10.07.07.01 General

Fill shall consist of sound, clean earth or a mixture of sound, clean earth and stones, broken rock, concrete or masonry from a source designated by the Contractor and approved by the City. The materials for the fill shall be deposited and spread in layers not more than 230 mm in depth prior to compaction, extending to the full width of the fill area.

Where a fill less than 300 mm in depth is proposed over an existing flexible pavement, such pavement shall be uniformly plowed or scarified, full depth and spread to form a uniform foundation before any new fill is placed thereon. Where such a fill is proposed over an existing rigid pavement or other structure, such pavement or structure shall be broken up and removed.

Where fills are to be constructed on existing slopes steeper than 1 vertical to 6 horizontal, steps with a horizontal dimension of not less than 1 m and a vertical dimension of not greater than 230 mm shall be formed in the slopes before any of the fill is placed.

Where the use of frozen material is permitted by the City, it shall be placed outside the limits of assumed 1:1 slopes, spreading outward from lines 1m outside of the edges of the proposed construction (pavement, interlocking brick, sidewalk, etc.).

Stones more than 750 mm in diameter shall be disposed of, off the site.

Where, in the opinion of the City, filling in layers of the specified thickness is not feasible, as in the case of filling in water, the fill may be constructed in one layer to the minimum elevation at which the equipment can be operated as determined by the City. The fill material placed in this manner shall be thoroughly compacted by approved methods capable of producing a uniform and well consolidated roadway foundation. Above this elevation, the fill shall be constructed in layers of the specified thickness.

In areas where stones are prevalent, the material shall be carefully place so that any large stones will be well distributed and the interstices completely filled with smaller stones, earth, sand or gravel so as to form a solid fill. Any rock or fragmental material or such size as would prohibit it from being placed in layers of the specified depth shall be placed in the fill only where and as directed or approved by the City.

TS 2.10.07.07.02 Moisture Content

Before compacting, the fill materials shall be brought to a moisture content within three (3) percentage points of the optimum content as specified in TS 501.

When the moisture content of the material is too low, water shall be added by means of pressure distributors or other equipment and thoroughly mixed into the soil by discing, harrowing, blading, or may be omitted for coarse sand and gravel soils.

When the moisture content of the material is too high, dry material may be thoroughly mixed with the wet material or the wet material may be dried to the required moisture content by discing, harrowing, blading, or by other approved means.

In addition to the above requirements regarding moisture content, the following requirements shall be as specified in TS 501:

- (1) The maximum dry unit weight shall not be less than 1500 kg/m³.
- (2) The Liquid Limit shall not exceed 65.
- (3) Where the Liquid Limit has a value between 41 and 65, the Plasticity Index shall not be less than 6/10 of the Liquid Limit, minus 9 (P.I. $\geq (0.6 \times \text{L.L.}) - 9.0$).

TS 2.10.07.07.03 Compaction

Soil which satisfies the above requirements and which contains moisture within the specified limits shall be compacted, using equipment approved by the City, to the densities given in Table 1, as determined by the use of Method 'A' in TS 501.

TABLE 1

Maximum Laboratory Dry Weight (kg/m ³)	Minimum Field Compaction Requirements (Percent of Laboratory Maximum Dry Weight)	
	Fills 3m or Less in Height	Fills Exceeding 3m in Height
1500-1600	100	100
1601-1760	95	100
1761 or more	95	95

TS 2.10.07.08 Backfilling of Overexcavated 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 City and compacted to the requirements of TS 501 for the type of material chosen. If the backfill is granular or a nonclay material the resulting area shall be fully drained prior to the backfill of the overexcavation. Drainage shall be accomplished using 150mm subdrain to the nearest ditch or catch basin and shall meet the requirements of TS 405.

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 conforming to TS 13.10.

TS 2.10.07.09 Disposing of Surplus and Unsuitable Material

All suitable surplus excavated material, which conforms with the requirements of section TS 2.10.07.06 of this specification, 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 City. All surplus and unsuitable material that cannot be used in the above manner shall be disposed of outside of the roadway limits, in which case the Contractor shall obtain and file with the City written permission from the owner of the property on which the material is to be placed. All such removal and spreading shall be completed before surfacing operations are started. No rehandling allowance will be made for any unsuitable material which has been deposited by the Contractor outside the grading limits.

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, manhole 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 City. The whole expense including that of hauling, unloading and spreading shall be born by the Contractor. All truckers must, as each load is delivered, obtain a ticket from the agent of the Department at the place of delivery or deposit, and must return the same to the Inspector on the work site, on each return trip. No allowance will be made for overhaul.

TS 2.10.08 QUALITY ASSURANCE – Not Used

TS 2.10.09 MEASUREMENT FOR PAYMENT

**TS 2.10.09.01 General Excavation
 Additional Excavation of Soft Spots (Provisional)**

Measurement for the above item (s) shall be by volume measured in m³.
The volume shall be calculated as the difference between cross sections of the original ground and the cross sections of the proposed subgrade or as measured and agreed upon in the field.

Where a separate item is included for removal of concrete or asphalt within the excavation limits, that volume shall 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 City 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 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 metres 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 metres 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 (Provisional) – Item**

Payment at the contract price for the above item(s) shall be full compensation for all labour, equipment, materials and incidentals to do the work. Payment shall include, but not be limited to, 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 City in writing.

Water used for dust control and compaction will be paid for under the appropriate item(s). Unshrinkable Fill, subdrain and subdrain components, if required, shall be paid for under the appropriate item(s).

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 item shall be full compensation for all labour, equipment, materials, and incidentals to do the work. Payment shall included, but not be limited to, 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 item shall be full compensation for all labour, equipment, materials and incidentals to do the work. Payment shall include, but not be limited to, the placing and compacting or approved excavated material in ditches and other low areas.