
PART I - GENERAL

- 1.1 Related Work .1 Rough Grading : Section 02211
- 1.2 Scope of Work .1 This section covers the supply and installation of sub-drainage piping including services and fittings, trenching, bedding and backfilling as indicated on the drawings as well as flushing and testing.
- .2 Coordinate work in this section with work in all other sections.
- 1.3 Guarantee .1 The contractor shall guarantee all material and workmanship for a period of two years from the date of Preliminary Acceptance by the City.

PART II - PRODUCTS

- 2.1 Materials .1 Backfill :
- .1 19 mm clear stone to OPSS 1004 to be used as backfill and compacted to 98% SPD. Insure drainage tile is not crushed when installing backfill.
- .2 The use of any bedding material or backfill material with diameter larger than 40 mm will not be permitted around any flexible pipe.
- .2 Surface :
- .1 Mississauga playground sand will be used where sand cover is required as per approved drawings. Refer to Section 02861 PART II - PRODUCTS 2.1
- .2 Areas to be sodded shall have 150 mm topsoil placed prior to sodding.
- .3 Piping :
- .1 Sub-drainage piping shall be 100 mm diameter filter wrapped perforated corrugated plastic drainage pipe manufactured for sub-surface land use.
- .2 Pipe material shall be resistant to chemicals present in soils and ground water, and shall be resistant to

- deterioration from ultraviolet light.
- .3 Tubing must be of uniform colour and density, free from any defects.
 - .4 100 mm tubing must have an internal diameter of 99.56 - 106.68 mm. Minimum water-inlet area must be 15.7 cm²/m in length.
 - .5 Individual inlet openings must have an opening ranging from 1-2 mm and should be arranged in a minimum of 3 rows, uniformly spaced around the circumference of the tubing.
 - .6 100 mm tubing shall have a minimum stiffness of 138 Pa at 5% deflection when tested in a parallel plate. There should be no evidence of a crack or split following an impact test.
 - .7 At any change of direction, use manufactured bends and fittings.
 - .8 All ends to be capped with manufactured caps.
 - .9 Drainage tiles emptying to swales shall be trimmed and fitted with rodent guard and 1 metre sleeve of 150 mm dia.pipe of the specified material.

PART III - EXECUTION

- 3.1 Notification of Utilities .1 Contractor must obtain stakeouts from all utilities concerned and must obtain all permits with regard to this installation.
- 3.2 Inspection .1 All materials shall be inspected by the contractor for damage in transit. No defective material shall be delivered to the site. Any material subsequently damaged shall be removed from the site immediately.
- .2 The contractor may be ordered by the Community Services Department to have pipe and fittings inspected by an accredited inspection company before being delivered to the site, and stamped with their approved mark on each piece.

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- .3 The Community Services Department may order tests of any material delivered to the site and may reject materials pending the result of tests.
- .4 Any material found to be defective in manufacture, or damaged before or after acceptance from the carrier, will be rejected by the Community Services Department and the contractor shall promptly remove such defective material from the site.
- 3.3 Trenching
- .1 After completing all rough grading, excavate trenches using a method approved by the Community Services representative. Trenches to have smooth bottoms with excavated material to be deposited away from the trench.
- .2 All trenches are to be excavated starting from the lowest elevation at the outlet and proceeding up grade.
- .3 Maximum spacing between trenches to be 12.5 m centre to centre or as shown on approved Layout and Grading drawings.
- .4 All excavated material is to be removed from the area.
- 3.4 De-watering
- .1 Keep excavations dry while work is in progress.
- .2 Dispose of water in a manner not detrimental to public health, environment, public and private property, or any portion of work completed or under construction.
- 3.5 Excavation
- .1 Excavate to lines, grades, elevations and dimensions indicated on drawings or as directed in the field.
- .2 Notify the consultant when soil at proposed elevation of trench bottom appears unsuitable for foundation of installation.
- .3 Remove unsuitable material from trench bottom to extend to a depth directed by Community Services.
- .4 Unless otherwise authorized by Community Services in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave trench open at end of day's operation.
- .5 Dispose of surplus and unsuitable excavated material off site.

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- .6 Do not obstruct flow of surface drainage.
- 3.6 Backfilling
- .1 Do not proceed with trench backfilling operations until Community Services has inspected and approved installations.
- .2 Use approved backfill material as indicated or directed.
- .3 Backfilling around installations :
- .1 Place bedding and surround material as noted on drawings.
- .2 Place layers simultaneously on both sides of installed work to equalize loading.
- .3 Place material by hand under, around and over installations until 150 mm of cover is provided. Dumping material directly on installations will not be permitted.
- .4 Do not place backfill in freezing weather without written permission of Community Services.
- .5 Compact granular backfill material to a minimum 95% of Standard Proctor Maximum Dry Density (ASTM D698-78).
- .6 Compact using approved mechanical tamping devices, or by hand tamping to achieve specified compaction.
- 3.7 Trench Bottom Preparation
- .1 Where required due to removal of unsuitable material or unauthorized over-excavation, bring bottom of excavation to design grade with approved material.
- .2 Compact trench bottom to density at least equal to density of adjacent surrounding soil.
- 3.8 Installation Inspection
- .1 Excavations require inspection and approval prior to commencement of installation operations.
- 3.9 Bedding
- .1 Place 150 mm layer of bedding material to full trench width as indicated and compact to minimum 95% of Standard Proctor Maximum Dry Density ASTM D698-78.

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- 3.10 Installation
- .1 Lay drains on prepared bed, true to line and grade with inverts smooth and free of sags or high points. Ensure barrel of pipe is in contact with the bed throughout.
 - .2 Commence laying at outlet and proceed in upstream direction.
 - .3 Make joints tight in accordance with manufacturer's instructions.
 - .4 Do not allow water to flow through pipes during construction except as approved.
 - .5 Make water tight connections to existing drains, new or existing manholes, and catch basins where indicated or as directed.
 - .6 Plug open upstream ends of pipes with water tight manufactured end caps.
 - .7 Backfill with granular material and sand base as directed.
 - .8 Protect sub-drains against flotation during installation.
- 3.11 Connections to Municipal Facilities
- .1 Connect sub-drains to municipal storm sewer system where indicated. Receive approval prior to backfilling.
- 3.12 Restoration
- .1 Clean and reinstate areas affected by work to satisfaction of the Community Services Department.
- 3.13 Flushing
- .1 Prior to inspection for final approval the contractor shall flush and thoroughly clean all sewers. The contractor shall provide all equipment and water required for this operation.

END OF SECTION 02712