SUB-DRAINAGE

PART 1 GENERAL

1.1 General Requirements

.1 The General Conditions and General Requirements are a part of this Section and shall apply as if written herein.

1.2 Related Work

.1	All Division 1	Specification Sections
.2	Section 02234	Topsoil Preservation
.3	Section 02315	Excavation, Trenching & Backfilling
.4	Section 02311	Site Grading
.5	Section 02911	Site Topsoil & Finish Grading

1.3 Scope of Work

.1 Work for this Section, includes, but is not necessarily limited to: Supply and installation of all tile drainage, pipe, services, and fittings, Trenching, excavation, and back filling as necessary, flushing and testing.

1.4 Notification of Utilities

.1 The Contractor must obtain stake outs from all utilities concerned and must obtain all permits with regard to this installation.

1.5 Inspection of Materials

.1 All materials shall be inspected by the Contractor for damage in transit. No defective materials shall be delivered to the site. Any material subsequently damaged shall be removed from the site immediately.

1.6 Guarantee

.1 All material and workmanship related to the sub-drainage shall be guaranteed for a period of two (2) years from the date of Substantial Performance of the work.

PART 2 PRODUCTS

2.1 PIPE

.1 Pipe to be 150 mm Rigid Perforated Plastic Drainage Tubing for subsurface land use and shall meet all standards of CGSB

41-GP-25.

.2 Pipe to be 100 mm Flexible Perforated Plastic Drainage Tubing for subsurface land use and shall meet all standards of CGSB 41-GP-25.

.3 Pipe material shall be resistant to chemicals present in soils and ground water, and shall be resistant to deterioration from ultraviolet light.

.4 Tubing must be of uniform colour and density, free from any defects.

.5 150mm tubing must have an internal diameter of 141.00mm. 100mm tubing must have an internal diameter of 89mm. Minimum water-inlet area must be 15.7 cm^2/m in length.

.6 Individual inlet openings must have an opening width ranging from 1 - 2 mm and should be ranged in a minimum of 3 rows, uniformly spaced about the circumference of the tubing.

.7 150 mm tubing shall have a minimum stiffness of 800 Pa at 5% deflection when tested in a parallel plate. There should be no evidence of a crack or split following an impact test.

.8 At any change of direction, use manufactured bends and fittings.

.9 All ends to be capped with manufactured caps.

.10 Granular backfill to be 19mm crushed stone in accordance with OPSS 1004.

.11 Filter Fabric – Terrafix 270 R non woven or approved alternate.

2.2 Geotextile Fabric

.1 Geotextile: Non Woven Terrafix 270R or approved alternate, synthetic fibre fabric, supplied in rolls.

.1 Width: 3.3m minimum
.2 Length: 150m minimum

.2 Physical Properties:

.1 Thickness: to CAN/CGSB-l48.l-M85, number 3, minimum 3mm.

.2 Mass per unit area: to CAN/CGSB-l48.l-M85, number 2, minimum

270 g/m^2.

.3 Tensile strength and elongation (in any principal direction): to CAN/CGSB-4.2-M77, method 9.2.

.1 Tensile strength: minimum 556 N, wet condition.

.2 Elongation at break: 70-100%.

.3 Ball burst, strength: to CAN/CGSB- 4.2-M77, method ll.2, minimum l350 N, wet condition.

.4 Securing pins and washers: to CAN3-G40.2l-M8l, Grade300W, hot-dipped galvanized with minimum zinc coating of 600g/m^2 to CSA G164-M8l.

PART 3 EXECUTION

3.1 Trenching

.1 After completing all rough grading, excavate trenches using a farm type wheel ditcher or backhoe. Other methods to be approved by the Consultant. Trenches to have smooth "U" shaped bottoms with excavated material deposited away from trench.

.2 All trenches are to be excavated starting from the lowest elevation at the outlet and proceed upgrade.

.3 Trench location to be as shown on the Contract Document layout and grading drawings.

3.2 Geotextile

.1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with securing pins.

.2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

.4 Overlap each successive strip of geotextile 500 mm over previously laid strip.

.5 Join successive strips of geotextile by sewing.

.6 Join successive strips of geotextile with securing pins as indicated.

.7 Protect geotextile material from displacement and damage until and during placement of additional material layers.

.8 After installation, cover with overlying layer within l day of placement.

.9 Replace damaged or deteriorated geotextile.

3.3 Piping

.1 Lay rigid and flexible pipe on bottom of trench, over filter fabric, starting at outlet and proceeding upgrade at a constant slope as indicated on layout and grading drawings. Connect pipe at junctions as shown on drawing.

3.4 Backfilling

.1 Place granular cover material in accordance with detail drawings. Ensure no contamination of granulars with adjacent soils.

.2 Place granular cover material in uniform layers not exceeding 150 mm.

.3 Close filter fabric over top of granulars with minimum 300mm overlap. Pin fabric seams at 1.0 metre intervals as per 2.2.3.

.4 Complete finished grading operations with placement of topsoil over drain. Ensure that the filter fabric barrier remains intact at all times.

3.5 Flushing

.1 Prior to Substantial Performance of the works inspection for final approval, the Contractor shall flush and thoroughly clean all sub-drains. The Contractor shall provide all equipment and water required for this operation.

END OF SECTION - 02712