

# S-16

## PERFORATED CORRUGATED POLYETHYLENE PIPE SUB-DRAINS

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#### 16.01. SCOPE OF WORK

This specification covers the constructing sub-drains of the required diameter of perforated corrugated polyethylene pipe with sock and the required outlets thereto, including all necessary excavation, backfilling and all other items of work as herein described.

#### 16.02. REFERENCES

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

- OPSS 1840

#### 16.03. MATERIALS

The Contractor will supply all materials. Materials shall meet the requirements of OPSS 1840.

#### 16.04. GRANULAR & NATIVE BACKFILL

This material, unless otherwise specified, shall be 16mm nominal size clear stone as per City of Windsor Standard Specification S-4.

## **16.05. CONSTRUCTION**

### **16.05.01 Time and Order of Performance**

The Contractor shall commence the works and carry them on at whatever point or points along the line of the drain that the City Engineer may direct.

### **16.05.02 Existing Conduits, Tracks, etc., Access to Property and Protection**

The Contractor shall be liable and responsible for the adequate support and for protection of sewers, drains, conduits, tracks or other structures owned by the Corporation or any private company or any individual enjoying franchise rights or occupying any portion of the street or way on, or below or above the surface. The Contractor shall provide access for traffic to houses and other premises, provide for proper protection against damage, and comply with all the requirements of the contract.

### **16.05.03 Excavation**

The trench shall be true to the line and grade required to match the line and grade of the concrete curb to be placed. The trench shall be of sufficient width to provide free working space and to permit compaction of backfill material around the pipe, but the width of the trench shall not exceed 300mm, unless permitted by the City Engineer in writing. When trenches are excavated wider than the above maximum caused by the use of power equipment, lack of bracing or other reasons, any increase in quantities of excavation, granular backfill or other items incurred by the excess width shall be borne by the Contractor.

Where required by conditions of the soil, sheeting apparatus shall be furnished and the cost of the sheeting, shoring, and bracing shall be borne by the Contractor.

The bottom of the trench shall be filled with a bed of 16mm nominal size clear stone backfill 50mm deep, and no point of the trench bottom shall be within 50mm of the grade line of the bottom of the pipe.

Where the bottom of the trench is in unstable soils, such as saturated clays and/or silts or quicksand, the trench shall be deepened to the depth required for granular backfill or whatever other means for securing good foundation, as required by the City Engineer.

Not more than 100 metres of cut shall be opened at any one time or placed in advance of the completed drain, unless by written permission of the City Engineer and for such distance as therein specified.

The Contractor shall be permitted to excavate for the placement of the sub-drain while excavating for the roadway, unless otherwise directed by the City Engineer.

The Contractor shall excavate for the sub-drain without any damage to any existing trees or the root systems of any trees adjacent to the trench where the sub-drain is to be placed.

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**16.05.04 Laying Pipes**

The trench shall, at all times, be kept dry and no pipes shall be laid in water or upon a wet bed, except when authorized in writing by the City Engineer. At all times during the progress of laying and backfilling and until the work has been accepted, the pipes shall be thoroughly cleaned, kept clean and protected from coatings of dirt. All pipes shall be laid true to line and grade. No length of pipe shall be laid until the preceding length has been thoroughly embedded and secured in place so as to prevent any movement or disturbance of the joint. All junctions shall be made with insert couplers manufactured by the manufacturer of the pipe. No pipe shall be left in the trench overnight without backfilling to protect it.

The Contractor shall ensure that the geo-textile sock remains intact and is free of tears and rips during and after placement. Where a field connection must be made to connect two pieces of pipe, the geo-textile sock is to overlap at the joint by a minimum of 300mm. The overlapping geo-textile sock is to be secured to the pipe at this point using plastic, one direction, locking ties to ensure the overlapped section remains intact during backfilling.

Proper foundation shall be provided in unstable soils by the addition of granular material as directed by the City Engineer.

**16.05.05 Sub-Drain Connections**

The sub-drains are to be connected to the pre-cast concrete catch basins by using the factory supplied “knock out” formed into the pre-cast unit. Should it have to be connected to an existing catch basin or other existing concrete structure, the Contractor shall core drill a hole in the existing structure no larger than 25mm greater than the pipe size. All connections to structures are to be mortared in place, using a rapid setting, waterproof, hydraulic cement mixed according to the manufacturer’s directions.

**16.05.06 Backfilling**

Backfill, unless otherwise specified, shall consist of 16mm nominal size clear stone and shall be placed over pipe sub-drains only after that section has been approved by the City Engineer. Any earth from cave-ins and all other objectionable matter shall be removed, cracked or crushed pipes removed or replaced and any other repair or attention required for a workman-like job shall be performed before any backfilling is commenced. Backfilling, except for the completion of any section or at the termination of a day’s work, shall be kept back at least 15 metres from the advanced end of the pipe. At the termination of a day’s work, backfilling shall be completed to the end of the pipe to protect it from cave-ins, falling stones, or other damage.

The granular backfill shall be placed in layers not exceeding 150mm in depth when compacted. Care shall be taken to ensure that the backfill is placed under the haunches and around the pipe. Compaction shall be performed in such a manner as not to injure or dislodge the pipe. The granular material shall be used to complete the backfilling to the top of the trench.

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**16.05.07 Inspection**

The Contractor shall prove his work throughout the entire length of the satisfaction of the City Engineer. Defective work or damaged materials shall be remedied or removed and replaced as directed by the City Engineer immediately on its discovery.

**16.05.08 Disposal of Surplus Materials, etc.**

As the trenches are filled in and the work completed, the Contractor shall, at his own expense and cost, removed and dispose of all surplus earth, stone, and other material from the work in such manner and at such points as directed by the City Engineer.

**16.06. MEASUREMENT FOR PAYMENT**

**16.06.01 Pipe Sub-Drain in Place**

Measurements will be made in lineal metres of the length of the pipe in place. Separate measurements shall be made of different diameters laid in accordance with the specifications and schedule of payments as called for on the tender.

**16.07. BASIS OF PAYMENT**

**16.07.01 Bid Prices for Laying Pipe**

Bid prices on the above items shall be in full compensation for the excavation of the trench and for the laying of the pipes, backfilling with granular material, the supply and use of all appliances and materials, the disposal of all surplus excavated materials and the satisfactory cleaning of the site and for all work required under this specification, excepting those items for which other payment is herein provided.

**16.07.02 Excavation for Pipe Sub-Drains**

The cost of the excavation shall be included in the submitted linear price for the placement of the sub-drain.

**16.07.03 Granular Backfill**

The cost of the granular backfill shall be included in the submitted linear price for the placement of the sub-drain. This payment shall be compensation in full for the supply, handling, hauling, placing and compacting all work herein specified incidental to this item.

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**16.07.04 Catch Basin/Structure Connection**

The cost of connecting the sub-drain to any concrete structure shall be included in the submitted linear price for the placement of the sub-drain. This payment shall be compensation in full for the connection.

The submitted linear price for the placement of the sub-drain shall include any work required to connect sub-drains including 1 linear metre of sub drains in both directions parallel with road for a total of 2 linear metres of sub-drain per connection that shall not be included in the linear measurement of the sub-drain unless otherwise directed by the City Engineer.