

**ITEM 11605.160001 M - FURNISH AND INSTALL MULTIPipe
GEOCOMPOSITE DRAIN**

1.0 DESCRIPTION

This work shall consist of constructing a prefabricated multipipe geocomposite drain in accordance with these specifications, at locations shown on the plans, and as directed by the Engineer.

2.0 MATERIALS

The drain conduit shall be of flexible, prefabricated rounded rectangular shape with dimensions as shown on the plans.

The drain conduit shall be wrapped with a nonwoven geotextile and shall be a nonwoven needlepunched construction and consist of long-chain polymeric fibers composed of polypropylene, polyethylene or polyamide. The fibers shall be oriented into a multi-directional stable network whereby they retain their positions relative with each other and allow the passage of water as specified. The fabric shall be free of any chemical treatment or coating, which reduces permeability and shall be free of any chemicals commonly found in soil. The geotextile shall conform to the following minimum average roll values.

Weight	ASTM D-3776	1.0 – 4.0
Tensile Strength	ASTM D-4632	100 – 130
Elongation%	ASTM D-4632	50 – 70
Puncture, lb	ASTM D-751	35 – 60
Mullen Burst, psi	ASTM D-3786	110 – 215
Trapezoidal Tear, lb	ASTM D-4533	40 – 42
Coefficient of Permeability	ASTM D-4491	2 – 4 cm/sec
Flow Rate, gpm/ft ²	ASTM D-4491	100 – 140
Permittivity, l/sec	ASTM D-4491	1.3 – 2.0
Apparent Opening Size, Maximum US Std Sieve Opening	ASTM D-4751	60/70
Seam Strength, lb/ft	ASTM D-4595	100
Fungus	ASTM G-21	No growth

All fittings, tees, adaptors and all other perforated piping shall be completely covered with factory-applied geotextile.

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The drainage core shall be made of a high density polyethylene. The core shall be constructed using interconnected corrugated pipes which define and provide the flow channels and structural integrity of the drain. The geotextile shall function only as a filter. The core of the edge drain shall conform to the following physical property requirements.

ASTM D-1777 (Thickness)	1.0
ASTM D-4716	17 gpm for .01 grade and 10psi pressure for 100 hrs.
	25 gpm vertical flow
ASTM D-2412	100 psi pipe stiffness
ASTM D-1621	6000 psi compressive strength (sand method)

Each Pipe shall be perforated with 1mm x 10mm vertical slots every 15mm

The fittings used with the edge drain shall be as recommended by the manufacturer for the edge drain.

Pipe for edge drain outlet laterals shall be either PVC pipe meeting the requirements of ASTM D-2729 or ASTM F-949, or high density polyethylene pipe meeting the requirements of AASHTO M252.

Gravel	703-0203
Sand	703-06

3.0 CONSTRUCTION DETAILS

3.1 Preparation for Installation of Multipipe Geocomposite Drain. Not less than two weeks prior to the start of the work, the contractor shall place surface stakeout of the areas to receive the drain system for review and approval of the Engineer, and private land owners if applicable. Trench excavations shall be as per the lines and grades shown on the plans.

3.2 Protection of Existing Facilities and Flora. Engineer and private residents may require changes to layout protect existing flora. Contractor shall identify the location of existing lawn sprinkler pipes and electrical facilities with representatives of the private residents prior to excavation.

3.3 Excavation. The amount of trench excavated at any time shall not exceed the amount of drain that can be successfully set and backfilled in one working day. The Contractor shall excavate a trench to the width shown on the plans. Existing turf shall be carefully removed,

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protected and kept moist during the duration of the operation. The contractor shall use hand excavation for installing pipe in existing planted areas soil.

3.4 Placement of Pipe and Backfill. The Contractor shall place the drain conduit to the lines and grades shown on the plans. The drain conduit shall be centered at the bottom of the trench. Gravel and sand backfill shall be placed as shown on the plans. Compaction shall be in accordance with the Engineers instructions. The trench shall then be filled with the previously excavated topsoil. Any damaged drains shall be replaced by splicing in an undamaged section of drain.

3.5 Replacement of Turf. The reserved turf shall be carefully placed and gently tamped into place over the excavation. Turf shall be watered. Any turf damaged by the contractor shall be replaced with new turf to the satisfaction of the private residents. Re-seeding shall not be permitted.

4.0 METHOD OF MEASUREMENTS

The quantity of the multiple geocomposite drain to be paid shall be the number of linear meters of multiple geocomposite drain successfully installed, including all excavation, care of trees of trees and shrubs in installation area, placement of multiple geocomposite drain, backfill of trench with gravel, sand and top soil, replacement of turf, and all else necessary to furnish and install multiple geocomposite drain.

5.0 BASIS OF PAYMENT

The unit price bid per linear meter for this work shall include the cost of furnishing all labor, material, equipment and resident coordination necessary to complete the work, including all necessary fittings.

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