

## Section 02639 Subdrainage

**PART 1: GENERAL**

## 1.01 RELATED WORK

Review Contract Documents for requirements that affect work of this section. Specification sections that directly relate to work of this section include, but are not limited to:

- Section 02315 - Excavation & Backfill
- Section 02630 - Storm Drainage Pipe
- Section 02790 - Athletic & Recreational Surfaces
- Section 02792 - Synthetic Grass & Turf

## SYSTEM DESCRIPTION

The subsurface drain system should consist of the Hydraway™ geocomposite drain and outlet pipes of the type, size and dimensions in accordance with these specifications and project plans, or as directed by the project engineer. The drain consists of a geotextile filter fabric heat fusion bonded to an internal high density polyethylene (HDPE) core. The drain should be lightweight, flexible, and sufficiently durable to withstand automated and/or manual installation procedures. Part number SEHY2000.

**PART 2: PRODUCTS**

## 2.01 GEOCOMPOSITE SUBSURFACE DRAIN SYSTEM

## ACCEPTABLE MANUFACTURERS:

SUBSURFACE DRAIN: Base; Hydraway 2000 manufactured by:  
Midwest Diversified Technology Inc., Caseyville, IL 62232  
Telephone: 800-223-7015 Fax: 618-398-5722 Email: info@hydraway.net

## COMPONENTS

The drain consists of a geotextile filter fabric heat fusion bonded to an internal high density polyethylene (HDPE) core. The drain should be lightweight, flexible, and sufficiently durable to withstand automated and/or manual installation procedures.

1. Core : High Density Polyethylene (HDPE)
  - a. Length: 150 foot
  - b. Widths: 6, 12, 18 or 24 inches
  - b. Depth: 1" minimum
2. Geotextile Fabric: Tencate - Mirafi® 140N
  - a. 4.5 ounce minimum
  - b. Heat fusion bonded to the core
3. Accessories:
  - a. Couplers, ends, outlets adapters as required and recommended by the manufacturer.
4. Geocomposite subsurface drain system shall meet the following ASTM standards as a minimum.

**ASTM STANDARDS:**

**CORE:**

ASTM D-1621 Standard Test Methods for Compressive Properties of Rigid Cellular Plastics

ASTM D-4716 Standard Method for Constant Head Hydraulic Flow Transmissivity (in-plane flow) of Geotextiles and Geotextile Related Products

ASTM D-1876 Standard Test Method for Peel Resistance of Adhesives (T-Peel Test)

**Table 1 – Core Material Requirements**

Product	Average Test Value	ASTM Test Method
Compressive Strength at maximum deflection of 20%	11,400 lbs/ft <sup>2</sup>	D1621
Flow Rate at 10 psi and gradient of 0.1	21 gpm/ft width	D4716
Peel Strength (Fabric to Core)	50 lbs/ft width	D1876

**GEOTEXTILE FABRIC (4.5 oz Tencate-Mirafi® 140N):**

ASTM D-4632 Standard Test Method for Grab Breaking Load and Elongation of Textiles

ASTM D-4491 Standard Test Method for Water Permeability of Geotextiles by Permittivity

ASTM D-4751 Standard Test Method for Determining Apparent Opening Size of a Geotextile

**Table 2 – Geotextile Fabric Requirements**

Product	Average Test Value	ASTM Test Method
Elongation	50 %	D4632
Grab Tensile	120 lbs	D4632
Permeability	135 gal/min/ft <sup>2</sup>	D4491
Apparent Opening Size	70 U.S. Std. Sieve	D4751

**PART 3: EXECUTION**

**3.03 INSTALLATION / QUALITY ASSURANCE**

**1. INSTALLATION EQUIPMENT**

All equipment necessary and required for the proper construction of the drain system should be in working condition and approved by the engineer. The contractor should also provide equipment to obtain proper compaction as needed.

## 2. INSTALLATION AND BACKFILL

### A. Geocomposite Drain

The geocomposite drain shall be installed at the planned grades, slope and location as specified on the plans in accordance with the manufactures recommendations. A minimum 0.05% grade shall be maintained. The excavation for vertical installation shall be a maximum of 4-inches wide; for flat (horizontal) applications the excavation should be dug to minimize over excavation beyond the width of the drain. Care should be taken to avoid damaging or applying excessive stresses to the drainage system.

All necessary splices are to be made with connections furnished by the manufacturer or approved by the engineer in accordance with the project specifications. The geocomposite drain and connectors should be inspected prior to backfill being placed. If the drain is found to be out of alignment or damaged, it should be removed and replaced as directed by the engineer.

Granular bedding and backfill for geotextile drain and outlet pipe shall be free draining clean crushed rock (3/4" maximum) or coarse sand/fine gravel (USDA/USGA particle size of 2 – 5 mm). Granular bedding should have minimum fines content. Compaction of the backfill shall be carried out in two separate operations. The first lift shall be a maximum of 8-inches thick using equipment designed for narrow trenches. The remainder of the backfill shall be compacted as directed by the engineer or in maximum 12-inch lifts and compacted to 90% of ASTM D698 (Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort) or as directed by the project engineer.

The amount of trench to be excavated should not exceed the amount that can be installed and backfilled in one working day.

### B. PVC/HDPE Outlet Pipe/Collector

Outlet Pipes should consist of 4-inch diameter (minimum) PVC conforming to ASTM D3034 (Standard Specification for Type PSM Poly (Vinyl Chloride)-PVC Sewer and Pipe Fittings. HDPE pipe may also be used.

The pipe joints should conform to the requirements of ASTM D3212 (Standard Specification for Joints for Drain and Sewer Plastic Pipes using Flexible Elastomeric Seals. The manufacturer shall provide the necessary fittings/joints used to join sections of the geotextile drain and connect the drain to the collectors and outlets.

The contractor should do all necessary excavation at the location and depth shown on the plans. A minimum 1% grade shall be provided for the outlet/collector pipes. The width of the outlet/collector pipe trench should be sufficient to permit jointing of the pipe and thorough tamping of the bedding material under and around the pipe. The trench width should not be less than the external diameter of the pipe plus 6 inches on each side, nor should it be wider at any point below the top of the pipe than the width of the pipe plus 12 inches on each side. The trench should extend to a depth of 6 inches below the pipe elevation. The trench walls should be approximately vertical, and excavated, braced and/or shored as required for safety in accordance with local governing laws.

Where soft or unstable soil conditions are encountered at the planned grade, they should be removed and replaced with approved granular material. The granular backfill should be compacted to provide adequate support for the outlet pipe. The engineer should determine the depth of removal needed and

type of granular backfill to be used. If the excavation extends below the planned depth, it should be backfilled in accordance with the engineer's recommendations using approved materials. Excavated material should be removed from the site or reused as directed by the engineer.

The geocomposite drain shall connect to the outlet/collector pipes or may daylight for discharge by gravity. Fittings shall connect the geocomposite drain to the PVC pipe in accordance with the drain manufacturer's recommendations at locations specified by the project plans. A galvanized rodent gate or other approved screen may be installed at the discharge end of each outlet where pipe is used.

The amount of trench to be excavated should not exceed the amount that can be installed and backfilled in one working day.

### 3. SHIPPING AND STORAGE

The Hydraway Drainage System is packaged and shipped in an opaque wrap that protects the material from dirt and ultraviolet light. The manufacturer recommends that the material remain wrapped or protected from exposure to ultraviolet light and from contamination (e.g. dirt) until it is used. Hydraway shall be protected from temperatures greater than 140°F.

Each roll, or shipping unit, of drain shall be marked with a tag, or other identification label showing the product type and number and the date of manufacture.

END OF SECTION