

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

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, have minimal "memory" when placed in horizontal position and sufficiently durable to withstand automated and/or manual installation procedures.

PART 2: PRODUCTS

2.01 GEOCOMPOSITE SUBSURFACE DRAIN SYSTEM

ACCEPTABLE MANUFACTURERS:

SUBSURFACE DRAIN: 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.

See Exhibit A on detail of construction of drain.

1. Core: High Density Polyethylene (HDPE)
 - a. Length: 150 to 550 feet
 - 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/ft²	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 ²	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**

Hydraway should be placed “points down” so the grid backing is at the top, this helps to protect the drain during the initial placement and compaction of the rock backfill.

Until the backfill is placed on the field, ALL wheeled traffic should be kept OFF the drain lines. Once a minimum of 4 inches of cover is placed, then TRACKED equipment can drive over the Hydraway lines. Tracked equipment will NOT damage the Hydraway lines as long as a minimum of 4 inches of cover is provided.

After 6 to 9 inches of cover is placed, wheeled equipment can be driven over the drain locations.

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.

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.

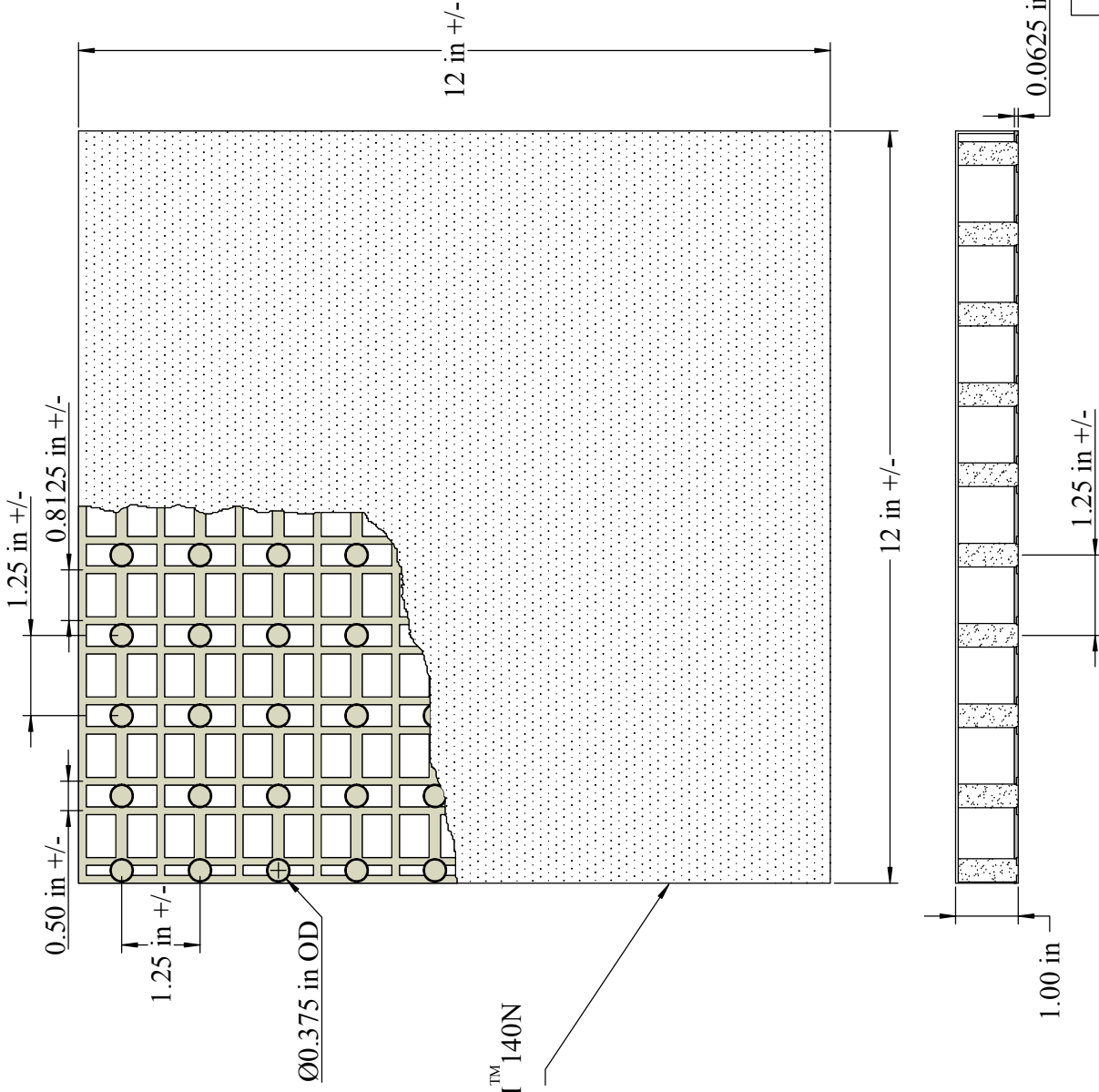
The amount of trench to be excavated should not exceed the amount that can be installed and backfilled in one working day.

3. SHIPPING AND STORAGE

The Hydraway Drainage System is packaged and shipped in an opaque wrap that protects the material from dust and ultraviolet light. The manufacturer recommends that the material remain wrapped or protected from exposure to ultraviolet light and from contamination until it is installed. 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



TenCate MIRAFI™ 140N
GEOTEXTILE