

Disclaimer: This document is intended to provide assistance to specifiers and other construction document professionals. The following text requires detailed review and careful editing before application to any construction project. ELJEN CORPORATION makes no warranty, express or implied, as to the accuracy or completeness of the information presented in this document nor to its suitability to a particular application.

SECTION 02546 [334619] - PREFABRICATED SUBSURFACE DRAINAGE SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes a prefabricated subsurface drainage system for the following:

1. Foundation (vertical) drainage.
2. Under slab (horizontal) drainage.
3. Under paving (horizontal) drainage.
4. Plaza deck (horizontal) drainage.
5. Retaining wall (vertical) drainage.
6. Landscaped area (horizontal) drainage.
7. Waterproofing membrane protection.
8. Slope stabilization.

- B. Products Installed But Not Supplied Under This Section:

1. Perforated drainage pipe.

- C. Related Sections include the following:

1. Division 2 [33] Earthwork sections for related excavation and backfill work, including control of backfill placement.
2. Division 2 [32] Paving sections for related site paving work.
3. Division 2 [32] Landscaping for related planting work.
4. Division 3 [03] Concrete sections for related concrete work.
5. Division 7 [07] Waterproofing Sections for applied waterproofing products and systems.

1.3 REFERENCES

- A. ASTM D 1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.

- B. ASTM D 1777 - Standard Test Method for Thickness of Textile Materials.
- C. ASTM D 4716 - Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.
- D. ASTM D 3776 - Standard Test Methods for Mass Per Unit Area (Weight) of Fabric.
- E. ASTM D 5034 - Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).
- F. ASTM D 5035 - Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method).
- G. ASTM D 4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- H. NYSDOT - "Geotextile Approved List for Prefabricated Composite Edge Drains," published by the New York State Department of Transportation (NYSDOT).

1.4 DEFINITIONS

- A. HDPS: High-density polystyrene plastic.
- B. PE: Polyethylene plastic.
- C. PP: Polypropylene plastic.
- D. PS: Polystyrene plastic.
- E. PVC: Polyvinyl chloride plastic.
- F. Subdrainage: Drainage system that collects and removes subsurface or seepage water.

1.5 SUBMITTALS

- A. Product Data: For the following:
 - 1. Prefabricated, pre-assembled drainage panels.
 - 2. Perforated pipe and fittings (to be installed with the work of other Sections).
 - 3. Waterproofing system protection.
- B. Approval of waterproofing manufacturer for use of selected drainage panels in contact with and for protection of waterproofing membrane system.

- C. NYSDOT Project: Submit (a letter of) Certification specifying proposed prefabricated drainage system products and stating that proposed core stock and fabric meet NYSDOT standards for prefabricated composite drain systems and are specifically listed as approved by NYSDOT on its "Approved List for Prefabricated Composite Edge Drains.
- D. Samples: Min. 6" x 8" representative sample of panel assembly including drainage core, geotextile fabric, stitching and support straps.
- E. Quality Assurance/Control Submittals.
- F. Design Data, Test Reports.
- G. Manufacturers' Installation Instructions.

1.6 QUALITY ASSURANCE

- A. Field Samples.
- B. Mock-Ups.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Storage and Protection:
 - 1. Store materials indoors in original packaging.
 - 2. At outdoor storage, protect materials from exposure to sunlight and excessive heat.
- B. Waste Management and Disposal:
 - 1. Handle and dispose of product wrappings and incidental waste material in accordance with applicable provisions of Div. 1.

1.8 PROJECT/SITE CONDITIONS

- A. Project/Site Environmental Requirements:
 - 1. Proceed with installation when air temperature at the site is greater than 40-deg F and less than 100-deg F.
 - 2. At installations performed at temperatures above 80-deg F, protect system products from extended exposure to direct sunlight.

1.9 SEQUENCING

1. Coordinate subsurface drainage system installation work with site and area preparation, excavation and backfill work of other sections.

1.10 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard materials warranty. Warranty period: 3 years, limited warranty for defective material and workmanship of the product only.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Subject to compliance with requirements, provide selected products by the manufacturer indicated.

2.2 PREFABRICATED PRE-ASSEMBLED DRAINAGE PANELS

- A. Fabric-wrapped sheet drainage panels: Provide prefabricated geocomposite drainage panels, 60 inches wide x heights [lengths] as selected [as indicated], consisting of thermoformed drainage core faced with geotextile filter fabric, factory-sewn closed along three panel edges, forming a pocket along one edge and an additional bottom pocket to receive drainage pipe. For vertical panels greater than 48" in height, provide through-panel fasteners along upper edge of assembly to prevent core slippage during vertical installations.

1. Manufacturer:

- a. Eljen Corporation, 125 McKee St., East Hartford CT 06106; Tel: (800) 444-1359; (860) 610-0426; Fax: (860) 610-0427; e-mail: info@eljen.com

2. Panel System:

- a. Provide Eljen Prefabricated Subsurface Drainage System (PDS) consisting of a polystyrene core thermo-formed with drainage channels on both faces, factory-wrapped with non-woven spunbonded polypropylene geotextile fabric folded and sewn closed on two edges to form a pocket (for drainage pipe), and including support straps at upper edge of panel, integrated system products of Eljen Corporation.
3. Cusped Drainage Core: Provide three-dimensional, nonbiodegradable, thermo-formed high-impact polystyrene meeting the following:

- a. Maximum Compressive Strength: 4,300 lb/sq. ft. (206 kPa) when tested in accordance with ASTM D 1621.
 - b. Minimum In-Plane Flow Rate: 15.9 gpm/ft. (199 L/min. per m)] of unit width at hydraulic gradient of 1.0% and compressive stress of 25 psi (172 kPa) when tested in accordance with ASTM D 4716.
 - c. Thickness: 0.75-inch, per ASTM D 1777.
4. Filter Fabric: Spunbonded 100% polypropylene geotextile fabric, non-woven, manufactured for subsurface drainage applications, with >50% elongation at break; AASHTO Class 3, complying with the following properties determined according to AASHTO M 288:
- a. Apparent Opening Size: 70 (0.21mm), 70/100 sieve, maximum.
 - b. Permittivity: 0.8 sec⁻¹ per ASTM D 4491.
 - c. Weight: 4.0 oz/sq.yd. per ASTM D 3776.

Specifier note: The manufacturer produces a variety of core materials, panel configurations and fabrics for special applications. Contact Eljen Corp. with unique project requirements or for more information.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and areas for suitable conditions where subdrainage system is to be installed.
- B. If subdrainage is required for landscaping, locate and mark existing utilities, underground structures, and aboveground obstructions before beginning installation and avoid disruption and damage of services.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate excavation, trenching and backfill operations at locations scheduled to receive drainage panel installations.
- B. Preparation: Examine areas to receive drainage system to verify that components will fit surfaces indicated and will fit to each other correctly.

3.3 INSTALLATION

- A. Coordinate panel placement and temporary support with drainage pipe installation and backfill work of other Sections.

- B. Install panels in sequence (as indicated) so that long edges abut and each panel's open fabric pocket can receive the fabric-wrapped edge of the next panel.
- C. Align successive panels in final position so that integral pipe pockets are in lateral alignment along lower edge and can accommodate drainage pipe installed in a continuous run.
- D. Support panels in final (vertical) position using integral panel support straps or nails, pegs, poles or other appropriate method until backfill operations are complete.

3.4 EARTHWORK AND BACKFILL

- A. Excavating, trenching and backfill are specified in Division 2 [31] Sections.
- B. Coordinate excavation, trenching and backfill operations at locations scheduled to receive drainage panel installations.
- C. Avoid disturbing or dislocating panels during backfill operations.
- D. Place backfill materials against installed panel surfaces in direction required to keep open-edged fabric pockets free of fill materials.
- E. Where required to avoid panel damage during placement of fill materials, provide temporary protection for panel surfaces (sheet plywood, etc.). Remove temporary panel protection upon completion of backfill placement.

3.5 REPAIRS

- A. Avoid tearing or damaging filter fabric during backfill operations. Overlay areas of torn or damaged fabric with additional fabric held in place until completion of backfill work.

3.6 FOUNDATION DRAINAGE INSTALLATION

- A. Coordinate foundation drainage system installation with related work of other Sections.

3.7 UNDERSLAB DRAINAGE INSTALLATION

- A. Coordinate under slab drainage system installation with related work of other Sections.

3.8 PLAZA DECK DRAINAGE INSTALLATION

- A. Coordinate plaza deck drainage system installation with related work of other Sections.

3.9 RETAINING-WALL DRAINAGE INSTALLATION

- A. Coordinate retaining wall drainage system installation with related work of other Sections.

3.10 LANDSCAPING DRAINAGE INSTALLATION

- A. Coordinate landscaping drainage system installation with related work of other Sections.

3.11 WATERPROOFING PROTECTION INSTALLATION

- A. Coordinate waterproofing protection system installation with related work of other Sections.

3.12 SLOPE STABILIZATION INSTALLATION

- A. Coordinate slope stabilization system installation with related work of other Sections.

END OF SECTION 02546 [334619]