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Product Guide Specification

Specifier Notes: This product guide specification is written in Construction Specifications Institute (CSI) 3-Part Format in accordance with *The CSI Construction Specifications Practice Guide*, including *MasterFormat*, *SectionFormat*, and *PageFormat*.

This section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with Division 1, other specification sections, and the Drawings. Delete all Specifier Notes after editing this section.

Section numbers and titles are based on *MasterFormat 2014 Update*.

SECTION 33 46 00

SUBDRAINAGE

Specifier Notes: This section covers NDS, Inc. "EZ Flow" drainage system. Consult NDS, Inc. for assistance in editing this section for the specific application.

Use of "EZ Flow" drainage system may contribute to LEED credits. Consult NDS, Inc. for more information.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Subdrainage system.

1.2 RELATED REQUIREMENTS

Specifier Notes: Edit the following list of related sections as necessary. Limit the list to sections with specific information that the reader might expect to find in this section, but is specified elsewhere.

- A. Section 31 23 00 – Excavation and Fill.
- B. Section 33 40 00 – Storm Drainage Utilities.

1.3 REFERENCE STANDARDS

Specifier Notes: List reference standards used elsewhere in this section, complete with designations and titles.

- A. ASTM D 3786 / D 3786M – Standard Test Method for Bursting Strength of Textile Fabrics—Diaphragm Bursting Strength Tester Method.
- B. ASTM D 4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

Specifier Notes: Delete ASTM F 405 if only drainage bundles without drain pipe are specified in Part 2 of this section.

- C. ASTM F 405 – Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings.

1.4 PREINSTALLATION MEETINGS

Specifier Notes: Edit preinstallation meetings as necessary. Delete if not required.

- A. Convene preinstallation meeting [1 week] [2 weeks] before start of Work of this Section.
- B. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, installer, and manufacturer's representative.
- C. Review the Following:
 - 1. Materials.
 - 2. Preparation.
 - 3. Installation.
 - 4. Adjusting.
 - 5. Cleaning.
 - 6. Protection.
 - 7. Coordination with other Work.

1.5 SUBMITTALS

Specifier Notes: Edit submittal requirements as necessary. Delete submittals not required.

- A. Comply with Division 1.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Shop Drawings: Submit manufacturer's shop drawings, indicating layout, dimensions, materials, components, and accessories.
- D. Samples: Submit manufacturer's sample of drainage bundle with drain pipe.
- E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- F. Sustainable Design Submittals: Submit manufacturer's sustainable design submittals for drainage bundles.
 - 1. Recycled Content: Certify percentages of post-consumer and pre-consumer recycled content.
 - 2. Regional Materials: Certify distance between manufacturer and Project, in miles.
- G. Manufacturer's Project References: Submit manufacturer's list of successfully completed subdrainage system projects, including project name and location, name of architect, and type and quantity of subdrainage systems furnished.
- H. Installer's Project References: Submit installer's list of successfully completed subdrainage system projects, including project name and location, name of architect, and type and quantity of subdrainage systems installed.
- I. Warranty Documentation: Submit manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged, for a minimum of 10 years, in the manufacturing of subdrainage systems of similar type to that specified.
- B. Installer's Qualifications:
 - 1. Installer regularly engaged, for a minimum of 5 years, in installation of subdrainage systems of similar type to that specified.
 - 2. Employ persons trained for installation of subdrainage systems.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:
 - 1. Store and handle materials in accordance with manufacturer's instructions.

2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
3. Store materials in clean areas, protected from exposure to harmful weather conditions.
4. Store materials out of direct sunlight.
5. Protect materials during storage, handling, and installation to prevent damage.

1.8 AMBIENT CONDITIONS

- A. During Cold Weather:
 1. Do not use frozen materials.
 2. Do not use materials mixed or coated with ice or frost.
 3. Do not build on frozen Work.
- B. During Wet Weather: Do not build on wet, saturated, or muddy subgrade.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: NDS, Inc., 851 North Harvard Avenue, Lindsay, California 93247. Toll Free 800-726-1994. Phone 559-562-9888. Toll Free Fax 800-726-1998. Fax 559-562-4488. Website www.ndspro.com. Email nds@ndspro.com.

Specifier Notes: Specify if substitutions will be permitted.

- B. Substitutions: [Not permitted] [Comply with Division 1].
- C. Single Source: Provide materials from single manufacturer.

2.2 MATERIALS

- A. Drainage Bundles: "EZ Flow" drainage system.

Specifier Notes: Choose **one** of the following **two** sentences, depending if drainage bundles without or with drain pipe are specified.

1. [Geosynthetic aggregate enclosed in geotextile mesh.] [Drain pipe surrounded by geosynthetic aggregate and enclosed in geotextile mesh.]

Specifier Notes: Delete drain pipe paragraph, if only drainage bundles without drain pipe are specified.

2. Drain Pipe:
 - a. Black, single-wall, extruded, corrugated, slotted, polyethylene (PE) pipe.
 - b. Recycled Content: Greater than 90 percent.
 - c. Slot Orientation: Random.
 - d. Compliance: ASTM F 405.

- e. Roughness Coefficient: 0.015.
- 3. Geosynthetic Aggregate:
 - a. Blue, lightweight, expanded polystyrene (EPS) geosynthetic drainage aggregate.
 - b. Recycled Content: 100 percent.
 - c. Aggregate Beads: Cubical, fine to medium cell structure, with protuberances that provide increased pore space and flow characteristics for drainage applications.
 - d. Void Space: 45 percent.
- 4. Geotextile Mesh:
 - a. Black, 30-sieve, knit, geotextile mesh sock holds drainage bundle together.
 - b. Mesh Fabric: Appropriate permeability for drainage, while limiting migration of soils into bundle and drainage system.
 - c. Apparent Opening Size: 0.60 mm.
 - d. Unit Weight: 2.5 to 3.5 ounces per square yard.
 - e. Strength, ASTM D 3786: 100 psi.
 - f. Flow Rate, ASTM D 4491: 300 gallons/square foot/minute at 3 inches of head.

B. Drainage Bundle Configurations:

Specifier Notes: Specify required drainage bundle configurations. Delete configurations not required.

- 1. 7-Inch Bundles Without Drain Pipe:
 - a. Part Number: EZ-0701A.
 - b. Bundle Diameter: 7 inches.
 - c. Drain Pipe: None.
 - d. Storage Volume: 8.8 gallons/10-ft bundle.
 - e. Flow Capacity: 37.1 gpm at 1 percent slope.
 - f. Length: 10 feet.
- 2. 7-Inch Bundles With Drain Pipe:
 - a. Part Number: EZ-0701F.
 - b. Bundle Diameter: 7 inches.
 - c. Drain Pipe: 3-inch diameter, centered in bundles.
 - d. Storage Volume: 11.4 gallons/10-ft bundle.
 - e. Flow Capacity: 80.8 gpm at 1 percent slope.
 - f. Length: 10 feet.
- 3. 10-Inch Bundles Without Drain Pipe:
 - a. Part Number: EZ-1001A.
 - b. Bundle Diameter: 10 inches.
 - c. Drain Pipe: None.
 - d. Storage Volume: 17.2 gallons/10-ft bundle.
 - e. Flow Capacity: 75.7 gpm at 1 percent slope.
 - f. Length: 10 feet.
- 4. 10-Inch Bundles With Drain Pipe:
 - a. Part Number: EZ-1001F.
 - b. Bundle Diameter: 10 inches.
 - c. Drain Pipe: 4-inch diameter, centered in bundles.
 - d. Storage Volume: 21.5 gallons/10-ft bundle.
 - e. Flow Capacity: 130.9 gpm at 1 percent slope.
 - f. Length: 10 feet.
- 5. 15-Inch Bundles Without Drain Pipe:

- a. Part Number: EZ-1501A.
 - b. Bundle Diameter: 15 inches.
 - c. Drain Pipe: None.
 - d. Storage Volume: 36.5 gallons/10-ft bundle.
 - e. Flow Capacity: 170.3 gpm at 1 percent slope.
 - f. Length: 10 feet.
6. 15-Inch Bundles With Drain Pipe:
- a. Part Number: EZ-1501F.
 - b. Bundle Diameter: 15 inches.
 - c. Drain Pipe: 6-inch diameter, centered in bundles.
 - d. Storage Volume: 45.8 gallons/10-ft bundle.
 - e. Flow Capacity: 345.0 gpm at 1 percent slope.
 - f. Length: 10 feet.
7. 15-Inch Bundles With Drain Pipe:
- a. Part Number: EZ-1501FB.
 - b. Bundle Diameter: 15 inches.
 - c. Drain Pipe: 6-inch diameter, bottom of bundles.
 - d. Storage Volume: 45.8 gallons/10-ft bundle.
 - e. Flow Capacity: 345.0 gpm at 1 percent slope.
 - f. Length: 10 feet.

2.3 ACCESSORIES

- A. Internal Couplings: Connects drainage bundle sections together.
- B. End Caps: Ends drainage bundle runs.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive subdrainage system.
- B. Notify Architect of conditions that would adversely affect installation or subsequent use.
- C. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Excavate trenches as indicated on the Drawings to widths and depths to accommodate subdrainage system.
- B. Slope trenches as indicated on the Drawings to flow toward outlets.
- C. Prepare and shape smooth trench bottom to have continuous contact with drainage bundles at elevations indicated on the Drawings.
- D. Ensure trenches are free of debris.

- E. Inspect drainage bundles for dirt, debris, and foreign objects before installation.

3.3 INSTALLATION

- A. Install subdrainage system in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install drainage bundles beginning at low point and work upstream.
- C. Use internal couplings provided by manufacturer to connect drainage bundle sections together.
- D. Cut drainage bundles to desired lengths in accordance with manufacturer's instructions.
- E. At the end of each work day, cover or plug upstream open ends of drainage bundles to prevent intrusion of dirt, debris, and foreign objects.
- F. Install specified fill material over drainage bundles as indicated on the Drawings.
- G. Lift Thickness and Compaction Density of Fill Material: As specified and indicated on the Drawings.
- H. Maintain cover over drainage bundles in areas subject to construction traffic in accordance with manufacturer's instructions.
- I. Ensure no large stones or debris are in contact with drainage bundles.

3.4 ADJUSTING

- A. Remove and replace with new material, damaged components that cannot be successfully repaired.

3.5 CLEANING

- A. Clean subdrainage system of accumulated dirt, debris, and foreign objects before final project completion.

3.6 PROTECTION

- A. Protect Work of this Section to ensure that Work will be without damage or deterioration at time of Substantial Completion.

END OF SECTION