SECTION 333451 - DRAINAGE FIELD SYSTEM

This Section specifies materials and installation requirements for drainage fields (also called leach fields) used to further treat effluent from septic tanks.

Concrete septic tanks are specified in Section 333413.13, fiberglass septic tanks are specified in Section 333413.23, and polyethylene septic tanks are specified in Section 333413.33. Distribution chambers are specified in Section 333453.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes: Drainage fields connected to septic tanks.
          2. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 310001 - Earthwork Materials: Bedding materials.

Section 310000 - Earthwork: Excavation and cover for filter piping.

Section 333413.13 - Concrete Septic Tanks: Materials and installation requirements for septic tanks constructed of concrete.

Section 333413.23 - Fiberglass Septic Tanks: Materials and installation requirements for septic tanks constructed of FRP.

Section 333413.33 - Polyethylene Septic Tanks: Materials and installation requirements for septic tanks constructed of HDPE.

Section 333453 - Distribution Chambers: Materials and installation requirements for distribution chambers used to divert septic tank effluent to drainage fields.

* + - 1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

LEED requires compliance with specific editions of referenced standards. Consider including publication dates for referenced standards in this Section to ensure that correct standard is used for LEED compliance.

* + - * 1. American Association of State Highway and Transportation Officials:

AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.

AASHTO T 180 - Standard Method of Test for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18-in. Drop.

* + - * 1. ASTM International:

ASTM C4 - Standard Specification for Clay Drain Tile and Perforated Clay Drain Tile.

ASTM C12 - Standard Practice for Installing Vitrified Clay Pipe Lines.

ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).

ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3).

ASTM D2729- Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

* + - 1. PREINSTALLATION MEETINGS
         1. Convene minimum [**one week**] [**<\_\_\_\_\_\_\_\_> weeks**] prior to commencing Work of this Section.
      2. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
        2. Manufacturer’s installation instructions shall be provided along with product data.
        3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
        4. Product Data: Submit manufacturer information on piping and <**\_\_\_\_\_\_\_\_**>.
        5. Shop Drawings: Indicate plan, location, and inverts of filter field, and inverts [**and centerlines**] of connecting piping.
        6. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

Include separate paragraphs for additional certifications.

* + - * 1. Manufacturer Instructions: Submit special procedures for drainage field installation.
        2. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
        3. Qualifications Statements:

Coordinate following subparagraph with requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer and installer.

Remove paragraph if not a LEED project.

* + - 1. SUSTAINABLE DESIGN SUBMITTALS
         1. Section 018113 - LEED Documentation Requirements: Requirements for sustainable design submittals.
         2. Manufacturer's Certificate:

Certify that products meet or exceed specified sustainable design requirements.

Insert material certifications list below to suit products specified in this Section and Project sustainable design requirements. Specific certificate submittal and supporting data requirements are specified in Section 018113.

Materials Resources Certificates:

Certify recycled material content for recycled content products.

Certify source for regional materials and distance from Project Site.

* + - * 1. Product Cost Data:

Submit cost of products to verify compliance with Project sustainable design requirements.

Exclude cost of labor and equipment to install products.

Provide cost data for following products:

Edit list of material cost data below to suit products specified in this Section and Project sustainable design requirements. Specific cost data requirements are specified in Section 018113.

Products with recycled material content.

Regional products.

<**\_\_\_\_\_\_\_\_**>.

* + - 1. CLOSEOUT SUBMITTALS
         1. Section 017716 - Contract Closeout: Requirements for submittals.
         2. Project Record Documents: Record actual locations and [**inverts**] [**centerlines**] of buried pipe, components, and connections.
         3. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.
      2. QUALITY ASSURANCE

Include following paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain <**\_\_\_\_\_\_\_\_**> [**copy**] [**copies**] of each standard affecting Work of this Section on Site.
      1. QUALIFICATIONS

Coordinate following paragraphs with requirements specified in SUBMITTALS Article.

* + - * 1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
        2. Installer: Company specializing in performing Work of this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
      1. DELIVERY, STORAGE, AND HANDLING
         1. Section 016500 - Materials and Equipment: Requirements for transporting, handling, storing, and protecting products.
         2. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
         3. Store materials according to manufacturer instructions.
         4. Protection:

Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.

Provide additional protection according to manufacturer instructions.

* + - 1. EXISTING CONDITIONS
         1. Field Measurements:

Verify field measurements prior to fabrication.

Indicate field measurements on Shop Drawings.

1. PRODUCTS
   * + 1. DRAINAGE FIELD PIPING
          1. Provide [**perforated**] [**unperforated**] pipe at filter field system and unperforated pipe through sleeves and at junction with distribution chamber.

If two or more pipe material types are required, consider identifying each material by "Type" and coordinate with PART 3 of this Section and with Drawings.

* + - * 1. PVC Pipe [**, Type <\_\_\_\_\_\_\_\_>**]:

Comply with ASTM D2729.

Nominal Inside Diameter: <\_\_\_\_\_\_\_\_> inches.

End Connections: Plain.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - 1. SUSTAINABILITY CHARACTERISTICS

Insert sustainable design characteristics in this Article to suit content of this Section and Project sustainable design requirements as specified in Section 018113.

* + - * 1. Section 018113 - LEED Documentation Requirements: Requirements for sustainable design compliance.
        2. Material and Resource Characteristics:

Recycled Content Materials: Furnish materials with maximum available recycled content [**including:**] [**.**]

Insert list of materials specified in this Section required to have recycled content.

<**\_\_\_\_\_\_\_\_**>.

Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project Site [**including:**] [**.**]

Insert list of materials specified in this Section required to be regional materials.

<**\_\_\_\_\_\_\_\_**>.

* + - 1. ACCESSORIES
         1. Geotextile Filter Fabric: As specified in Section 310001 - Earthwork Materials.

1. EXECUTION
   * + 1. EXAMINATION
          1. Verify that septic tank connection, size, location, and invert are as indicated on Drawings.
       2. PREPARATION
          1. Ream pipe ends and remove burrs.
          2. Remove scale and dirt from components before assembly.
          3. Establish [**invert**] [**centerline**] elevations for each component in system.
          4. Remove stones, roots, and other obstructions.
       3. INSTALLATION
          1. Drainage Field Piping:

Bedding:

Place as required in Section 310000 - Earthwork.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

As shown on Contract Drawings.

Establish slope of bed to accommodate established invert elevations.

Place pipe sloping away from header at minimum of [**1/16**] <\_\_\_\_\_\_\_\_> in./ft. [**, with perforations facing down**].

Wrap pipe joints with geotextile fabric and cover sides and top with [**Type <\_\_\_\_\_\_\_\_>**] [**aggregate**] [**sand**].

[**Place geotextile fabric over cover prior to backfilling.**]

Cover entire field with [**Type <\_\_\_\_\_\_\_\_>**] [**aggregate**] [**sand**] to depth of [**12**] <\_\_\_\_\_\_\_\_> inches, lightly compact, and level.

Place subsoil cover as specified in Section [**310000 - Earthwork**].

* + - 1. FIELD QUALITY CONTROL
         1. Request inspection by [**Director’s Representative**] <**\_\_\_\_\_\_\_\_**> prior to placing cover over piping.

Consult geotechnical report to select compaction test method appropriate to fill materials being used and Project requirements.

Select test standards referenced in following paragraph as appropriate for fill materials and Project requirements.

* + - * 1. Compaction Testing:

Comply with requirements of Section 310000 - Earthwork.

If tests indicate Work does not meet specified requirements, remove Work, replace, and retest. Coordinate with Director’s Representative.

Testing Frequency: <**\_\_\_\_\_\_\_\_**>.

* + - 1. PROTECTION
         1. Do not permit [**vehicular**] traffic over drainage field. Provide signage identifying vehicle traffic is not permitted.

END OF SECTION 333451