SECTION 333413.33 - POLYETHYLENE SEPTIC TANKS

This Section specifies materials and installation requirements for polyethylene (HDPE) septic tanks. Effluent wet wells may be included for use in low-pressure (STEP) sewage collection systems.

Concrete septic tanks are specified in Section 333413.13, and fiberglass septic tanks are specified in Section 333413.23. Drainage field (leaching) systems are specified in Section 333451, and distribution chambers are specified in Section 333453.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes: Polyethylene (HDPE) septic tanks [**with effluent wet wells**].
          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 requirements for septic tanks.

Section 333219 - Septic Tank Effluent Pumps: Effluent pumps for use in STEP systems.

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 fiberglass.

Section 333451 - Drainage Field System: Materials and installation requirements for drainage fields (also called leach fields) used to further treat effluent from septic tanks.

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

* + - 1. DEFINITIONS
         1. HDPE: High-density polyethylene.
      2. 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 HB-17 - Standard Specifications for Highway Bridges.

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 D638 - Standard Test Method for Tensile Properties of Plastics.

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

ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

ASTM D1238 - Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.

ASTM D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique.

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

ASTM D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products.

ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

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

ASTM F1473 - Standard Test Method for Notch Tensile Test to Measure the Resistance to Slow Crack Growth of Polyethylene Pipes and Resins.

* + - 1. 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 tank and <**\_\_\_\_\_\_\_\_**>.
        5. Shop Drawings: Indicate plan, location, 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 septic tank [**and effluent wet well**] installation.
        2. Source Quality-Control Submittals: Indicate results of [**shop**] [**factory**] tests and inspections.
        3. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
        4. 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 Certificate: 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.

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. Transport and handle septic tanks with equipment designed to protect units from damage.
         4. Store materials according to manufacturer instructions.
         5. Protection:

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

Do not place septic tanks in position that causes them to overstress, warp, or twist.

Provide additional protection according to manufacturer instructions.

1. PRODUCTS
   * + 1. HDPE SEPTIC TANKS [**AND EFFLUENT WET WELLS**]
          1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12817&mf=04&src=wd):

Norwesco, LLC, (952) 446-1945, PO Box 439, 4365 Steiner St., St. Bonifacius, MN 55375.

Infiltrator Water Technologies, (800) 221-4436, 4 Business Park Rd., PO Box 768, Old Saybrook, CT 06475.

Approved equivalent.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

* + - * 1. Description:

Capacity: [**<\_\_\_\_\_\_\_\_> gal**] [**As indicated on Drawings**].

Maximum Burial Depth: 36 inches.

Inlets and Outlets:

Extrusion welded on inside and outside of manhole.

Furnish gussets at quarter points around inlets and outlets.

Connections:

Larger than 4-Inch Pipe: [**Butt-fusion welded**] [**Electrofusion welded**] [**Flanged**].

4-Inch and Smaller Pipe: [**Butt-fusion welded**] [**Electrofusion welded**] [**Flanged**] [**Threaded**].

* + - * 1. Materials:

HDPE.

Type: 3408.

Comply with ASTM D3350.

Minimum Cell Classification: 345464 C.

* + - * 1. Performance and Design Criteria:

Loading: [**Non-traffic**] [**H-20; AASHTO HB-17**].

Density:

Not less than <\_\_\_\_\_\_\_\_> lb./cu ft..

Comply with ASTM D1505.

Melt Index:

Not greater than <\_\_\_\_\_\_\_\_> lb. per 10 minutes.

Comply with ASTM D1238.

Flex Modulus:

<\_\_\_\_\_\_\_\_> to less than <\_\_\_\_\_\_\_\_> psi.

Comply with ASTM D790.

Tensile Strength at Yield:

<\_\_\_\_\_\_\_\_> to less than <\_\_\_\_\_\_\_\_> psi.

Comply with ASTM D638.

Slow Crack Growth Resistance:

Greater than 100 hours.

Comply with ASTM F1473.

Hydrostatic Design Basis:

<\_\_\_\_\_\_\_\_> psi at <\_\_\_\_\_\_\_\_> degrees F.

Comply with ASTM D2837.

Remove paragraph if not a LEED project.

* + - 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:

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. MATERIALS
         1. Septic Tanks [**and Effluent Wet Wells**]:

[**Crosslinked**] [**Linear**] PE.

No fillers will be accepted.

* + - 1. SOURCE QUALITY CONTROL
         1. Provide shop inspection and testing of completed assembly, including hydrostatic testing for leakage.

Include one or both of following paragraphs to require Director’s inspection or witnessing of test at factory, if requested.

* + - * 1. Director’s Inspection:

Make completed HDPE septic tank [**and effluent wet well**] available for inspection at manufacturer's factory prior to packaging for shipment.

Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspection is allowed.

* + - * 1. Director’s Witnessing:

Allow witnessing of factory inspections and test at manufacturer's test facility.

Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspections and tests are scheduled.

Include following paragraph if reliance on manufacturer's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance:

If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.

Specified shop tests are not required for Work performed by approved manufacturer.

1. EXECUTION
   * + 1. EXAMINATION
          1. Verify that building sanitary sewer connection, size, location, and invert are as indicated on Drawings.
       2. PREPARATION
          1. Conduct operations as not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures, utilities, and landscape in immediate or adjacent areas.
          2. Ream pipe ends and remove burrs.
          3. Remove scale and dirt from components before assembly.
          4. Establish [**invert**] [**centerline**] elevations for each component in system.
          5. Remove stones, roots, and other obstructions.
       3. INSTALLATION
          1. Tank and Bedding:

Excavate as specified in Section [**310000 - Earthwork**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

Hand trim excavation for accurate placement of tank to indicated elevations.

Place bedding material level and in continuous layers not exceeding [**6**] [**8**] <\_\_\_\_\_\_\_\_> inches of compacted depth.

Compact to [**95**] <**\_\_\_\_\_\_\_\_**> percent maximum density.

Backfill around sides of tank, tamp in place, and compact to [**95**] <**\_\_\_\_\_\_\_\_**> percent maximum density.

Maintain optimum moisture content of bedding material to attain required compaction density.

Install septic tank, distribution chamber, and related components on bedding.

* + - * 1. Interconnecting Piping: Connect inlet and outlet sanitary piping.
      1. FIELD QUALITY CONTROL
         1. Request inspection by [**Director’s Representative**] <**\_\_\_\_\_\_\_\_**> prior to placing cover over tank and piping.

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

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

AASHTO T 180 in following paragraph is similar to ASTM D1557.

* + - * 1. Compaction Testing:

Comply with [**ASTM D1557**] [**ASTM D698**] [**AASHTO T 180**] [**ASTM D6938**].

If tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

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

END OF SECTION 333413.33