SECTION 333413.13 - CONCRETE SEPTIC TANKS

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

Fiberglass septic tanks are specified in Section 333413.23, and polyethylene septic tanks are specified in Section 333413.33. Drainage field (leaching) systems are specified in Section 333451, and distribution chambers are specified in Section 333453.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes: Concrete 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 333413.23 - Fiberglass Septic Tanks: Materials and installation requirements for septic tanks constructed of fiberglass.

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

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. 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 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 A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

ASTM C33 - Standard Specification for Concrete Aggregates.

ASTM C150 - Standard Specification for Portland Cement.

ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.

ASTM C890 - Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.

ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.

ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.

ASTM C1227 - Standard Specification for Precast Concrete Septic Tanks.

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

* + - 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 <**\_\_\_\_\_\_\_\_**>.

USE PARAGRAPH BELOW WITH EPD REQUIREMENT WHEN PROJECT ESTIMATE IS $1M OR MORE.

* + - * 1. Submit an Environmental Product Declaration (EPD) from the manufacturer for each type of precast structure within this specification section, if available. A statement of the contractor’s good faith effort to obtain the EPD shall be provided if not available.

Manufacturer-provided EPDs must be Product Specific Type III (Third-Party Reviewed), in adherence with ISO 14025 *Environmental labels and declarations*, ISO 14044 *Environmental management – Life cycle assessment*, and ISO 21930 *Core rules for environmental product declarations of construction products and services.*

* + - * 1. Shop Drawings: Indicate plan, location, and inverts [**and centerlines**] of connecting piping.
        2. 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 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 source and origin for [**salvaged**] [**and**] [**reused**] products.

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.

Salvaged, refurbished, and reused products.

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. Transport and handle precast concrete units 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 concrete units in any position that causes them to overstress, warp, or twist.

Provide additional protection according to manufacturer instructions.

1. PRODUCTS
   * + 1. CONCRETE SEPTIC TANKS [**AND EFFLUENT WET WELLS**]
          1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12815&mf=04&src=wd):

Fort Miller Co., Inc., (518) 695-5000, PO Box 98, Schuylerville, NY 12871

Monarch Products, (717) 938-8303, 385 Sipe Road, York Haven, PA 17370.

Oldcastle Infrastructure, (888) 965-3227, 8392 Riverview Parkway, Littleton, CO 80125

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**].

Design: Comply with ASTM C890 for live loading and installation conditions.

Fabrication:

Comply with ASTM C913.

Reinforced and air-entrained concrete.

Watertight.

Minimum 28-Day Compressive Strength: 5,000 psi.

Honeycombed or retempered concrete will not be accepted.

Remove paragraph if not 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:

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

Portland Cement: Comply with ASTM C150, Type II.

Coarse Aggregates:

Comply with ASTM C33.

Grading: 1 inch to No. 4 sieve.

Sand:

Comply with ASTM C33.

Fineness Modulus: 2.35.

Water:

Potable.

Clean and free of injurious amounts of acids, alkalis, salts, organic materials, and substances incompatible with concrete or steel.

Air-Entraining Admixtures: Comply with ASTM C260.

Reinforcing Steel:

Deformed Bars: Comply with ASTM A615, Grade [**40**] [**60**].

Welded Wire Fabric: Comply with ASTM A1064.

Joint Sealant: Comply with ASTM C990.

* + - 1. FABRICATION
         1. Comply with ASTM C913.
         2. Fabricate precast concrete structures to dimensions as indicated on Drawings and as specified.
      2. SOURCE QUALITY CONTROL
         1. Provide shop inspection and testing of completed assembly.

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 concrete 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. Hydrostatic Testing: Test tanks for watertightness using hydrostatic method according to ASTM C1227.
        2. Compaction Testing:

Comply with Section 310000 - Earthwork.

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

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

END OF SECTION 333413.13