SECTION 333413.23 - FIBERGLASS SEPTIC TANKS

This Section specifies materials and installation requirements for fiberglass (FRP) 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 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: FRP 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 333413.33 - 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. DEFINITIONS
         1. FRP: Fiberglass-reinforced plastic.

Remove paragraph if not a LEED project.

* + - 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 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. American Water Works Association:

AWWA D120 - Thermosetting Fiberglass-Reinforced Plastic Tanks.

* + - * 1. ASTM International:

ASTM C581 - Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass-Fiber-Reinforced Structures Intended for Liquid Service.

ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics.

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 D3753 - Standard Specification for Glass-Fiber-Reinforced Polyester Manholes and Wetwells.

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

* + - * 1. UL:

UL 1316 - Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures.

* + - 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 following 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 any position that causes them to overstress, warp, or twist.

Provide additional protection according to manufacturer instructions.

1. PRODUCTS
   * + 1. FRP SEPTIC TANKS [**AND EFFLUENT WET WELLS**]
          1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=12816&mf=04&src=wd):

Design Tanks, (888) 830-0061, 612 W. Blackhawk St., Sioux Falls SD 57104.

Portable Tanks, A Division of GEI Works Inc., (863) 563-3312, P.O. Box 700338, Wabasso, FL 32970.

Approved equivalent.

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

* + - * 1. Description:

Material: FRP resin.

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

Maximum Burial Depth: 84 inches.

Riser:

24-Inch Diameter and Smaller: Fiberglass pipe cut to fit into top of tank.

30-Inch Diameter: Furnish support adapter.

Inlet and Outlet Piping:

[**2**] <\_\_\_\_\_\_\_\_>-inch PVC, Schedule 40.

Grommets: [**EPDM**] [**Fiberglass lay-up**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Performance and Design Criteria:

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

Comply with UL 1316.

Comply with AWWA D120.

Chemical Resistance: Comply with ASTM C581 and D3753.

Flexural Strength (Conic Section):

Hoop: <\_\_\_\_\_\_\_\_> psi.

Axial: <\_\_\_\_\_\_\_\_> psi.

Flexural Strength (Cylindrical Section):

Hoop: <\_\_\_\_\_\_\_\_> psi.

Axial: <\_\_\_\_\_\_\_\_> psi.

Compressive Strength:

<\_\_\_\_\_\_\_\_> psi.

Comply with ASTM D695.

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 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**]:

100-percent resin and glass-fiber reinforcement.

Sand fillers will not be accepted.

* + - 1. FABRICATION
         1. Comply with AWWA D120 and UL 1316.
      2. SOURCE QUALITY CONTROL
         1. Testing:

Internal Load:

Air Pressure:

Less than 12-Foot Diameter: 5 psig.

12-Foot Diameter: 3 psig.

Safety Factor: 5:1.

Equipment Acceptance: Adjust, repair, modify, or replace components failing to withstand air pressure test and rerun tests.

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

* + - * 1. Director’s Inspection:

Make completed FRP 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.

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

* + - * 1. Compaction Testing:

Comply with the 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: <**\_\_\_\_\_\_\_\_**>.

END OF SECTION 333413.23