SECTION 330577 - FIBERGLASS METERING MANHOLES

This section specifies packaged fiberglass metering manholes used for installation of flumes.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Fiberglass metering manholes.

* + - * 1. 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 033000 - Cast-in-Place Concrete: Manhole base pad.

Section 310000 - Earthwork: Excavating for manholes, structures, and foundation slabs.

Section 310001 – Earthwork Materials: Soils for backfill in trenches; Bedding fill type; Backfilling after manhole installation.

Section 333100 - Sanitary Sewerage Piping: Piping connections to metering manholes.

Section 334200 - Stormwater Conveyance: Piping connections to metering manholes.

Section 407169 - Open Channel Flow Meters: Parshall flumes and accessories.

* + - 1. DEFINITIONS

Limit list of definitions to terms unique to this section and not provided elsewhere.

* + - * 1. FRP: Fiberglass-reinforced plastic.
			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 Transportation Officials:

AASHTO HB-17 - Standard Specifications for Highway Bridges.

AASHTO M306 - Standard Specification for Drainage, Sewer, Utility, and Related Castings.

* + - * 1. ASTM International:

ASTM A48 - Standard Specification for Gray Iron Castings.

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

ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.

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

ASTM D2563 - Standard Practice for Classifying Visual Defects in Glass-Reinforced Plastic Laminate Parts.

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

ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

* + - * 1. Occupational Safety and Health Administration:

OSHA 1910.27 - Fixed Ladders.

* + - 1. COORDINATION
				1. Coordinate Work of this Section with connection to [**municipal sewer utility service**] [**facility sanitary sewer system**] [**facility storm sewer system**] <**\_\_\_\_\_\_\_\_**> and trenching.
			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 for covers, component construction, features, configuration, critical dimensions, catalog cuts, specifications, and installation instructions.
				5. Shop Drawings:

Indicate structure locations and elevations.

Indicate sizes and elevations of [**piping,**] [**conduit,**] penetrations [**, and**].

* + - * 1. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

Include separate paragraphs for additional certifications.

* + - * 1. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
				2. Source Quality-Control Submittals: Indicate results of [**shop**] [**factory**] tests and inspections.
				3. Qualifications Statements:

Coordinate following subparagraphs with requirements specified in qualifications article.

Submit qualifications for manufacturer and installer.

Submit manufacturer's approval of installer.

* + - 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 of manholes and connections, and record invert elevations.
			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 paragraph 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 [**and approved by manufacturer**].
			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. Handling: Comply with manhole manufacturer instructions for unloading, and moving precast manholes and drainage structures.
				4. Storage:

Store materials according to manufacturer instructions.

Store manholes to prevent damage to State property or other public or private property.

Repair property damaged from materials storage.

* + - * 1. Protection:

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

Take precautions to prevent damage to interior or exterior surfaces when handling.

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. PACKAGE FIBERGLASS METERING MANHOLES
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=13270&mf=04&src=wd):

Plasti-Fab, (888) 446-5377, 116 Pine Street S, Lester Prairie, MN 55354.

Tracom FRP, (877) 435-8637, 6575-A Industrial Way, Alpharetta, Georgia 30004

Approved equivalent.

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

* + - * 1. Description:

Corrosion-resistant FRP manhole with sealed FRP bottom and fiberglass access ladder.

Size: [**<\_\_\_\_\_\_\_\_> inches in diameter by <\_\_\_\_\_\_\_\_> feet in depth**] [**As indicated on Drawings**].

Furnish integral [**3**]-inch-wide anchoring flange.

* + - * 1. Performance and Design Criteria:

Load Rating:

AASHTO HS-20 with 30% impact and 130 lb/cf equivalent soil pressure.

Chemical Resistance: Comply with ASTM C581 and D3753.

Flexural Strength (Conic Section):

Hoop: [**15.400 x 103**] <**\_\_\_\_\_\_\_\_**> psi.

Axial: [**17.200 x 103**] <**\_\_\_\_\_\_\_\_**> psi.

Flexural Strength (Cylindrical Section):

Hoop: [**22.500 x 103**] <**\_\_\_\_\_\_\_\_**> psi.

Axial: [**14.300 x 103**] <**\_\_\_\_\_\_\_\_**> psi.

Compressive Strength:

[**18.90 x 103**] <**\_\_\_\_\_\_\_\_**> psi.

Comply with ASTM D695.

* + - * 1. Surfaces:

Exterior: Free of blisters larger than 1/2 inch in diameter, delamination, and exposed fibers.

Interior: Resin-rich with no exposed fibers, crazing, delamination, blisters larger than 1/2 inch in diameter, and wrinkles greater than 1/4 inch in depth.

* + - * 1. Walls and Floor:

Material:

FRP.

Molded in one piece.

FRP Resin: Polyester.

Minimum Thickness: 1/2 inch.

Surfaces:

Interior: 10-to-20-mil-thick gelcoat.

Exterior: 15-to-20-mil-thick gelcoat.

Paint or other coatings will not be accepted.

Exterior: Free of blisters larger than 1/2 inch in diameter, delamination, and exposed fibers.

Interior: Resin-rich with no exposed fibers, crazing, delamination, blisters larger than 1/2 inch in diameter, and wrinkles greater than 1/4 inch in depth.

* + - * 1. Materials:

Reinforcing Material: Glass mat, Grade E.

Laminate: Multiple layers of glass matting and resin.

* + - * 1. Accessories:

Designer of Record should review subsurface data and provide required anti-flotation measures as needed.

Base Pad:

Cast-in-place concrete as specified in Section [**033000 - Cast-in-Place Concrete**].

Increase thickness of concrete base to prevent flotation, as approved by Director’s Representative.

Hardware:

Material: Stainless steel.

Comply with ASTM F593.

Parshall Flume:

[**Integral with manhole**] [**and**] [**as specified in Section 407169 - Open Channel Flow Meters**].

Furnish fiberglass grating over flume to provide walking surface.

Accessway:

Configuration: Concentric.

Size: [**<\_\_\_\_\_\_\_\_> inches by <\_\_\_\_\_\_\_\_> inches in depth**] [**As indicated on Drawings**].

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

Cover:

Security: [**Lockable**] [**Boltable**] [**None**].

Material: Cast iron; [**ASTM A48, Class 30B**] [**AASHTO M306**].

Identification: Cast with [**identifying name and logo**] [**<\_\_\_\_\_\_\_\_> name and logo**] [**identifying name**] [**<\_\_\_\_\_\_\_\_> name**].

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

Connections:

PVC sewer plain-end pipe attached to metering manhole with resin and glass-fiber-reinforced layup.

Resin and Fiberglass Layup: Match type and grade as used in fiberglass metering manhole.

Boots: Comply with ASTM C923.

Size: As indicated on Drawings.

Internal Ladder:

Rungs: Non-slip traction surface and internal stainless-steel safety bar.

Comply with OSHA 1910.27.

Instrument Shelf: Fiberglass.

Vent Piping: As indicated on Drawings.

Exhaust Fan: Explosion proof.

Utility Taps:

Size: 2 inches.

Material: FRP.

Connections Threaded.

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

Utility Taps: As indicated on Drawings.

* + - * 1. Covers:

[Manufacturers](http://www.specagent.com/LookUp/?ulid=13271&mf=04&src=wd):

Plasti-Fab, (888) 446-5377, 116 Pine Street S, Lester Prairie, MN 55354.

Tracom FRP, (877) 435-8637, 6575-A Industrial Way, Alpharetta, Georgia 30004

Approved equivalent.

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

* + - 1. SUSTAINABILITY CHARACTERISTICS

Insert LEED sustainable design characteristics in this article to suit content of this section and project sustainable design requirements specified in Section 018113. Following two paragraphs contain examples.

* + - * 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. SOURCE QUALITY CONTROL
				1. Inspection and Testing:

Provide shop inspection and testing of completed assembly.

Maintain testing records and submit to Director’s Representative.

Comply with ASTM D2563 for allowable tolerance based on defect.

Pinholes or Pores in Laminate Surface: None.

Exposed Glass: None.

Exposure of Cut Edges: None.

Scratches: None greater than 0.002 inch deep.

Foreign Matter: None.

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

* + - * 1. Director’s Inspection:

Make completed fiberglass metering manhole 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 tests 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 items provided by other Sections of Work are properly sized and located.
				2. Verify that built-in items are in proper location and are ready for roughing into Work.
				3. Verify correct size of manhole and structure excavation.
				4. Verify that excavation base is ready to receive Work and excavations and that dimensions and elevations are as indicated on [**Drawings**] [**layout drawings**].
			2. PREPARATION
				1. Mark each manhole with waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers as indicated on Drawings to indicate its intended use.
				2. Coordinate placement of inlet and outlet pipe as required by other Sections.
				3. Do not install manholes where Site conditions induce loads exceeding structural capacity of manholes or structures.
				4. Inspect manholes immediately prior to placement in excavation to verify that they are internally clean and free from damage; remove and replace damaged units.
			3. INSTALLATION
				1. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface structures or utilities in immediate or adjacent areas.
				2. Remove large stones or other hard matter impeding consistent backfilling or compaction.
				3. Protect manhole from damage or displacement while backfilling operation is in progress.
				4. Excavating:

As specified in Section [**310000 - Earthwork**] and in indicated locations and depths.

Provide clearance around sidewalls of manhole for construction operations [**, granular backfill**] [**, and**] [**placement of geotextile filter fabric**].

If ground water is encountered, prevent accumulation of water in excavations; place manhole in dry trench.

Where possibility exists of watertight manhole becoming buoyant in flooded excavation, anchor manhole to avoid flotation as indicated on the Contract Drawing.

* + - * 1. Base and Alignment: Place foundation slab and trowel top surface level.

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

* + - * 1. Base and Alignment: Install manholes supported at proper grade and alignment [**support system as indicated on Drawings**].
				2. Base Pad:

Form and place cast-in-place concrete base pad with provision for sewer pipe end sections.

Place manholes plumb and level and anchor to foundation slab.

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

* + - * 1. Base Pad: Install manholes supported at proper grade and alignment [**as indicated on Drawings**].
				2. Attachments:

As Work progresses, build [**fabricated metal items**] [**and**].

Set cover frames and covers level to correct elevations without tipping.

* + - * 1. Backfilling: As specified in Section [**310000- Earthwork**]

END OF SECTION 330577