SECTION 331417 - SITE WATER SERVICE UTILITY LATERALS

This Section specifies pipe materials, fittings, valves, meters, and backflow preventers normally encountered with 2-inch water service connections and small commercial and light industrial buildings and residential homes.

See Drawing Coordination Checklist and Evaluations for information needed to coordinate this Specification Section with Drawings.

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

Pipe and fittings for 2-inch water service connections to buildings.

Corporation stop assemblies.

Curb stop assemblies.

Backflow preventers.

Meter setting equipment.

Meter boxes.

* + - * 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 221100 - Facility Water Distribution: Connections to building water service.

Section 310001 - Earthwork Materials: Bedding- and backfill-material type.

Section 310000 - Earthwork: Excavation and backfilling of pipe trench.

Section 330110.58 - Disinfection of Water Utility Piping Systems: Flushing and disinfecting of water system.

Section 330509.33 - Thrust Restraint for Utility Piping: Thrust restraints as required by this Section.

Section [**330563 - Concrete Vaults and Chambers**] [**330577 - Fiberglass Metering Manholes**]: Vaults and metering boxes.

Section 331900 - Water Utility Metering Equipment: Water meters as required by this Section.

* + - 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. American Society of Mechanical Engineers:

ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.

ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

* + - * 1. American Society of Sanitary Engineering:

ASSE 1012 - Performance Requirements for Backflow Preventers with an Intermediate Atmospheric Vent.

ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers.

* + - * 1. ASTM International:

ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings.

ASTM B88 - Standard Specification for Seamless Copper Water Tube.

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 D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).

ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.

ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.

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

* + - * 1. American Welding Society:

AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

* + - * 1. American Water Works Association:

AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.

AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances.

AWWA C800 - Underground Service Line Valves and Fittings.

AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. Through 3 In. , for Water Service.

AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.

* + - 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 regarding pipe materials, pipe fittings, corporation stop assemblies, curb stop assemblies, meters, meter setting equipment, service saddles, backflow preventers, and accessories.
				5. 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. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections. Qualifications Statement:

Coordinate following subparagraph with requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer.

Remove paragraph below if not LEED project.

* + - 1. SUSTAINABLE DESIGN SUBMITTALS
				1. Manufacturer's Certificate:

Certify that products meet or exceed specified sustainable design requirements.

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 piping mains, curb stops, connections, thrust restraints, pressure-pipe centerline elevations, and gravity-pipe invert elevations.
				3. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.
			2. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

* + - * 1. Perform Work according to [**NYSDOH**] <**\_\_\_\_\_\_\_\_**> standards.

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.
			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. PRODUCTS
	* + 1. WATER PIPING AND FITTINGS
				1. Copper Tubing:

Comply with ASTM B88.

Type: [**K,**] [**L,**] annealed.

Fittings: [**Cast copper; ASME B16.18**] [**or**] [**wrought copper; ASME B16.22**].

Joints: [**Compression connection**] [**or**] [**BCuP silver braze; AWS A5.8/**].

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

* + - * 1. PVC Pipe:

Comply with ASTM [**D1785, Schedule 40**] [**D1785, Schedule 80**] [**D2241, SDR-26 for 160-psig pressure rating**] [**D2241, SDR-41 for 100-psig rating**] [**D2241, SDR-21 for 200-psig rating**].

Fittings: PVC; ASTM D2466.

Joints: Solvent welded; ASTM D2855.

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

ASTM D3035 piping is available in 10 different wall thicknesses, ranging from DR 32.5 (thinnest) to DR 7 (thickest), with pressure ratings from 160 psig to 840 psig. Coordinate wall thickness and pressure rating with required service conditions.

* + - * 1. PE Pipe:

Comply with [**AWWA C901**] [**ASTM D3035, DR <\_\_\_\_\_\_\_\_>, for <\_\_\_\_\_\_\_\_> psig pressure rating**].

Fittings:

Type: [**Molded**] [**or**] [**fabricated**].

Comply with AWWA C901,

Joints: [**Compression**] [**Butt fusion**].

* + - 1. CORPORATION STOP ASSEMBLIES

Determine if local municipality has selected standard products.

* + - * 1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=8764&mf=04&src=wd):

A.Y. McDonald Mfg. Co, (563) 583-7311, 4800 Chavenelle Road, Dubuque, IA 52002.

Mueller Water Products, (770) 206-4200, 1200 Abernathy Road, NE, Suite 1200, Atlanta, Georgia 30328.

Romac Industries Inc., 21919 20th Avenue SE, Suite 100, Bothell, WA, 98021.

Smith-Blair, 30 Globe Avenue, Texarkana, AR 71854.

Approved equivalent.

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

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

* + - * 1. Corporation Stops:

Type: [**Ground key**].

Comply with ASTM B62.

Body: Brass or red brass alloy.

Inlet End: Threaded for tapping according to AWWA C800.

Outlet End: Suitable for service pipe specified.

* + - * 1. Service Saddles:

Material: Stainless Steel

Type: Full wrap.

Working Pressure: Up to [**150-psi**] [**or**] <**\_\_\_\_\_**>

* + - 1. CURB STOP ASSEMBLIES
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=8765&mf=04&src=wd):

A.Y. McDonald Mfg. Co, (563) 583-7311, 4800 Chavenelle Road, Dubuque, IA 52002.

Mueller Water Products, (770) 206-4200, 1200 Abernathy Road, NE, Suite 1200, Atlanta, Georgia 30328.

Approved equivalent.

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

* + - * 1. Curb Stops:

Body: Brass or red brass alloy.

Comply with ASTM B62.

Valve Type: Ball.

Sealing: Positive pressure.

* + - * 1. Curb Boxes and Covers:

Body: Cast iron.

Type: [**Extension**].

Base: [**Arch pattern**].

Provide foot piece.

Lid:

Inscription: WATER.

Plug: Pentagonal.

* + - 1. BACKFLOW PREVENTERS
				1. As specified in Section 331416 – Site Water Utility Distribution Piping.
			2. WATER METERS
				1. As specified in Section 331900 - Water Utility Metering Equipment.

Remove paragraph below 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. 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. EXECUTION
	* + 1. EXAMINATION
				1. Verify that building service connections and municipal utility water main sizes, locations, and inverts are as indicated on [**Shop**] Drawings.
			2. PREPARATION
				1. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, and remove burrs.
				2. Remove scale and dirt from inside and outside of piping before assembly.
				3. Prepare pipe connections to equipment with flanges or unions.
			3. INSTALLATION
				1. Corporation Stop Assemblies:

Make connection for each different kind of water main, using suitable materials, equipment, and methods as approved by Director’s Representative.

Coordinate use of direct tap corporation stop/service saddle with Drawings.

Provide service clamps for mains constructed of materials other than cast iron or ductile iron.

Location:

Screw corporation stops directly into tapped and threaded iron main at 10- and 2-o'clock positions along main's circumference.

Locate and stagger corporation stops at least 12 inches apart longitudinally.

Plastic Pipe Mains:

Provide full support for service clamp for full circumference of pipe, with minimum 2-inch width of bearing area.

Exercise care against crushing or causing other damage to mains at time of tapping or installation of service clamp or corporation stop.

Use seals or other devices such that no leaks are present in mains at points of tapping.

Do not backfill and cover service connections until installation has been approved by Director’s Representative.

* + - * 1. Bedding:

Excavate pipe trench as specified in Section [**310000 - Earthwork**].

Backfill around sides and to top of pipe as specified in –Section 310000 - Earthwork.

Place fill materials as specified in Section 3–10000 - Earthwork.

* + - * 1. Pipe and Fittings:

Maintain separation of water main from [**sewer**] <**\_\_\_\_\_\_\_\_**> [**piping**] <**\_\_\_\_\_\_\_\_**> according to NYSDOH requirements.

Install pipe to allow for expansion and contraction without stressing pipe or joints.

Install access fittings to permit disinfection of water system.

Thrust Restraints: Form and place concrete for thrust restraints at each elbow or change of direction of pipe.

Establish elevations of buried piping with not less than [**5**] <\_\_\_\_\_\_\_\_> feet of cover.

Pipe Markers: As specified in Section 330597 - Identification and Signage for Utilities.

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

* + - * 1. Curb Stop Assemblies:

Set curb stops on [**solid bearing**] [**compacted soil**] <**\_\_\_\_\_\_\_\_**>.

Boxes:

Center and plumb curb boxes over curb stops.

Set box cover flush with finished grade.

* + - * 1. Backflow Preventers:

Install backflow preventers where indicated on Drawings and according to manufacturer instructions.

Testing and Installation Requirements: Comply with NYSDOH requirements and plumbing codes.

* + - * 1. Service Connections:

Install water service [**as indicated on Drawings**] <**\_\_\_\_\_\_\_\_**>.

Install water service to within 5 feet of building and connect to building water service.

Include following subparagraph if pipe sleeve protection is required.

Metal Sleeve:

Install metal sleeve surrounding service main to [6] <\_\_\_\_\_\_\_\_> inches above [**floor**] [**slab**], and minimum [6] <\_\_\_\_\_\_\_\_> feet below grade.

Size: Accommodate minimum 2 inches of insulation.

* + - * 1. Precast-Concrete Vaults: As specified in Section 330563 - Concrete Vaults and Chambers.

Review disinfection procedure for compliance with local code requirements.

* + - * 1. Disinfection of Water Piping System: Flush and disinfect system as specified in Section [**330110.58 - Disinfection of Water Utility Piping Systems**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.
				2. Installation Standards: Install Work according to NYSDOH requirements.
			1. TOLERANCES
				1. Install pipe to indicated elevation to within tolerance of [**5/8**] <**\_\_\_\_\_\_\_\_**> inch.
			2. FIELD QUALITY CONTROL
				1. Testing:

Pressure test water distribution system according to AWWA C600 <**\_\_\_\_\_\_\_\_**>.

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

Pressure test system according to AWWA C600 and following:

Test Pressure: Not less than 200 psig or 50 psi in excess of maximum static pressure, whichever is greater.

Conduct hydrostatic test for a minimum of two hours.

Slowly fill with water section to be tested, and expel air from piping at high points.

Install corporation cocks at high points.

Close air vents and corporation cocks after air is expelled.

Raise pressure to specified test pressure.

Observe joints, fittings, and valves under test.

Remove and renew cracked pipes, joints, fittings, and valves that show visible leakage. Retest.

Correct visible deficiencies and continue testing at same test pressure for additional two hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psi of test pressure.

Leakage is defined as quantity of water supplied to piping as necessary to maintain test pressure during testing period.

Compute maximum allowable leakage using following formula:

L = SD x sqrt(P)/C.

L = testing allowance, gph.

S = length of pipe tested, feet.

D = nominal diameter of pipe, inches.

P = average test pressure during hydrostatic test, psig.

C = 148,000.

If pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size.

Leakage:

If test of pipe indicates leakage greater than that allowed, locate source of leakage, make corrections, and retest until leakage is within allowable limits.

Correct visible leaks regardless of quantity of leakage, coordinate repairs with Director’s Representative.

* + - * 1. Perform pressure test on water distribution system according to NYSDOH standards.

END OF SECTION 331417