

**SUB WATER DEPARTMENT
STANDARD CONSTRUCTION SPECIFICATIONS
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**SECTION 33 12 13
WATER SERVICE CONNECTIONS**

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PART 1 GENERAL

1.1 Description

Work includes furnishing and installing service connections 2 inches in diameter and smaller from the main to the water meter. New water meters, where required, shall be furnished and installed by the Owner unless otherwise specified.

1.2 Reference Specifications, Codes, and Standards

- A. ANSI/AWWA C800 Underground Service Line Valves and Fittings
- B. ANSI/ASME B16.15 Cast Bronze Threaded Fittings, Classes 125 and 250
- C. National Sanitation Foundation (NSF) Standard 61 & 372
- D. Ductile Iron Pipe Research Association (DIPRA)

1.3 Submittals

- A. Product technical data and material data including all pipe, service saddles, fittings, and appurtenance information shall be in accordance with Section 01 33 00 Submittal Procedures. Provide manufacturer's handling, delivery, storage and installation requirements.
- B. Provide pipe manufacturer's certificate stating that the materials have been sampled and tested in accordance with the provisions for and meet the requirements of the designated specification. An authorized agent of the manufacturer shall sign the certificate.

1.4 Quality Assurance

- A. Unless otherwise noted, all water works materials provided shall be new, of first class quality and shall be made by reputable manufacturers. All material of like kind shall be provided from a single manufacturer unless otherwise approved by the Owner's Representative. All material shall be carefully handled and installed in good working order free from defect in manufacture, storage and handling. Where an item is to be used but does not have its quality specified herein, it shall be equal to that specified in the appropriate American Water Works Association (AWWA) Standard Specification.
- B. All references to Standards of AWWA or other organizations shall be the latest version of those Standards.

PART 2 PRODUCTS

2.1 General

- A. Service line material shall conform to the latest version of AWWA C800 and as follows. Unless otherwise specified, the minimum working pressure rating of all service line material shall be 150 psi. In addition, all water works materials provided shall be rated for the test pressures indicated for the water main and as specified in Section 33 13 00, Testing and Disinfection of Potable Water Utilities. All materials in contact with potable water shall be NSF/ANSI Standard 61 certified and meet the "lead free" requirements of the Safe Drinking Water Act amendment, effective January 4, 2014, as per the lead content evaluation procedures outlined in NSF/ANSI Standard 372.

2.2 Service Saddles

Service saddles will have a CI body with Mueller cc thread outlet for 1-inch taps or female iron pipe thread (FIPT) for 2-inch taps unless otherwise specified in the plans. CI bodies will be nylon coated for corrosion protection. All bodies for use on C-900/905 PVC pipe will be pre-formed to the OD pipe size of the pipeline being tapped. All saddles will have stainless steel straps, nuts, and washers.

Acceptable service saddles:

Romac; Ford; Smith Blair

Furnish saddles from one of the following approved manufacturers and models

1. A.Y. McDonald, #3825, 3826
2. Ford, #101B, 202B
3. James Jones Co., #J979, J975
4. Mueller, #BR1B, BR2B
5. Smith Blair, 325 Series 103 only

2.3 Service Pipe

- A. Copper Pipe and Tubing -- Copper tubing service pipe shall be annealed, seamless, and conform to the requirements of ASTM B 88, Type K. Sizes 1-inch and below shall be soft drawn design, 0.065-inch wall thickness. Sizes larger than 1-inch shall be hard drawn design, 0.083-inch wall thickness.
- B. Brass Nipples & Fittings – Brass Pipe shall conform to the standard dimensions, weights, and tolerances for "regular" weight pipe in accordance with ASTM B43. Material composition shall be copper alloy UNS No. C23000. Pipe shall be furnished in the annealed condition to Standard No. "O

61" in accordance with ASTM B601. Testing and certification of results shall be prepared by the manufacturer in accordance with the ASTM Specification for each of the categories being bid. In addition, mill test reports for the brass pipe in accordance with ASTM B43 shall be provided.

- C. Polyethylene (PE) Pipe Materials - PE pipe for 1-inch service lines shall be copper tube size (CTS) and PE pipe size 2 inch shall be iron pipe size (IPS). PE piping for service lines shall comply with Section 33 11 13.24, "Polyethylene Pressure Pipe".
- D. PVC Duct - PVC Duct used for long service installations shall be Schedule 40 conduit with integral female socket for solvent weld joint or SDR 13.5 HDPE. Size will be a minimum of 3 inches, and in accordance with Standard Drawing W1.00 unless otherwise specified in the plans.

2.4 Brass Service Fittings

A. General

1. Brass and bronze service fittings shall conform to the latest version of AWWA C800.
2. Service fitting materials in contact with potable water shall be made of copper alloys in accordance with the chemical and mechanical requirements of ASTM B584, meeting the "lead free" requirements as specified above.
3. All castings shall not have injurious blowholes, porosity, shrinkage defects, cracks, or other injurious defects. Castings shall not be plugged, welded, burned in, or impregnated. All threads shall mesh snugly, be clean cut, and be of uniform pitch. All valves shall be carefully cored and machined to insure evenly balanced walls. The keys shall be properly machined and ground and shall be covered with a non-corrosive, non-toxic, food grade grease. Mechanical surfaces shall have a 100% machine finish with no gaps or low spots due to insufficient parent material.
4. All fittings shall either be stamped or embossed with the manufacturer's name. Another marking identifying the item as complying with NSF 61 per the requirements of NSF 372 for "lead free" as described under 2.1.A above, e.g., 'NL or G for Annex G', shall be cast or permanently stamped on the service fitting.

Acceptable cast bronze fittings:

Mueller;

Ford;

McDonald

B. Corporation And Curb Stops, Meter Valves, and Couplings

1. Corporation stops for water services, air valves, chlorinating, and testing shall be supplied in conformance with AWWA C800 and ASTM B62, Mueller male (CC) corporation valve inlet thread, unless otherwise noted on the Plans. Outlet to be compression joint or Mueller Instatite for copper tube size (CTS).
2. Angle meter valves shall be supplied in conformance with AWWA C800 and ASTM B62. Inlet to be compression joint or Mueller Instatite for CTS.
3. Corporation stops for direct tapping shall have AWWA tapered thread inlet and outlet connections compatible with copper tubing. Thread patterns for the saddle outlet and corporation stop inlet shall be the same.
4. Couplings and unions shall be supplied in conformance with AWWA C800 and ASTM B62. Connections to service lines shall be compression joint or Mueller Instatite for CTS.
5. Furnish insulating corporation stops for all service line connections to cathodically protected water mains.

Acceptable Brass/Bronze Fittings

Ford;

McDonald;

Mueller

C. Brass and Bronze Pipe Nipples

Brass pipe nipples shall be in conformance with ASTM B687. Pipe nipples shall meet the composition and mechanical properties for pipe. Threads for pipe nipples will conform to Sections 6 and 11 of AWWA C800, and ASME/ANSI Standard B1.1 as noted in Category B. Standard length and size of nipples shall conform to Section 7 and Table 2 of ASTM B687 for standard close nipples. All other provisions of ASTM B687 "Brass, Copper and Chromium-Plated Pipe Nipples" shall apply to the materials furnished.

2.5 Meter Boxes

- A. Approved water meter boxes shall be provided at every water service assembly at the locations shown on the plans in accordance with Standard Drawing W1.00, or as directed by the Engineer. Minimum meter box size shall be 13 inches wide, 24 inches long, and 12 inches deep. All edges shall be clean and smooth for safe handling. Covers shall have dimensions appropriate for the meter box size, with a hinged reader lid.

Acceptable meter boxes:

Armorcast, Straight wall Polymer Concrete Boxes with 20k rated cover and hinged reader lid

PART 3 EXECUTION

3.1 General

- A. All materials, workmanship and installation shall conform to referenced AWWA Standards and other requirements of these Specifications. The methods employed by the Contractor in the storage, handling, and installation of pipe, fittings, valves and appurtenances shall be such as to insure that the material, after it is placed, tested and permanently covered by backfilling, is in as good a condition as when it was shipped from the manufacturer's plant. Should any damage occur to the material, repairs or replacement shall be made to the satisfaction of the Owner's Representative at no expense to the SUB.
- B. Water service assemblies shall be furnished and installed by the Contractor at the locations shown on the plans or as directed by the Engineer and shall be no smaller than 1 inch. The Contractor shall furnish all labor, equipment, materials, and tools necessary to install, complete, and ready for operation the assemblies as shown on the plans and herein specified. The Contractor shall perform the installation of the services in accordance with Standard Drawings W1.00 through W1.08 so that meters can be installed to the clearance and grades shown with + 0.2 feet. There shall be no splices or unions in new service lines.

3.2 Installation

- A. Construct the depth of trench for service connection piping to provide a minimum of 36 inches of cover over the top of the pipe, unless otherwise shown. Do not damage the main in any way during the service installation. Excavation, backfill and surface restoration shall be performed in accordance with provisions stated in Sections 31 23 33 Trenching and Backfill, 32 19 00 Surface Removal, Restoration and Cleanup, and as shown on the plans.

- B. Service Renewal – Install service line and angle meter stop from the water main to the inside of existing meter box location. Where service renewals are to be connected to existing meters, stub up and terminate service run at angle meter stop where shown. Where no meter is to be installed, place angle meter valve in an approved box per Standard Drawing W1.02.2. The Owner will connect all service lines at the new meters or to existing service piping as shown. Adjust meter box to finished grade after the service piping has been installed and surface has been restored to the satisfaction of the Owner's Representative.
- C. All water service installations under existing pavement, curbs, sidewalks or other surface improvements may be installed by trenchless construction techniques at Contractor option where ground conditions are favorable and such methods will not disturb foundations under curbs, sidewalks and other structures. SUB must approve all trenchless installation methods. Where trenchless pipe installation is used, payment for the pipe installation will be made for the equivalent trench excavation and backfill as if the open cut method was used. Payment will not be made for surface restoration including pavement, curbs, sidewalks and other surface improvements whose replacement is avoided by use of a trenchless method, such as tunneling.
- D. Meter Boxes - Each meter box shall be set on 4-inches minimum of compacted 3/4 inch crushed aggregate at an elevation that places the top of the meter box cover flush with the proposed grade as specified. When set in a concrete collar, or as directed by the Engineer, meter box installations shall be in accordance with Standard Drawing W1.16.1.

3.3 Water Main Tap

- A. Direct tap ductile iron pipe that is Class 52 or thicker for corporation stops according to the recommendations of DIPRA unless direct taps are prohibited elsewhere in the Contract Documents. Service Saddles are required on water mains 4 inches in diameter and for all services taps larger than 1 inch. Double strap service saddles are required on all service taps larger than 1 inch.
- B. Prior to performing any taps, the Contractor shall submit to the Engineer for approval the equipment and procedure he intends to utilize for the water main taps. Service taps shall be located at the 10:00 or 2:00 position on the circumference of the pipe. Two or more service lines may be installed in the same trench when tapped with a minimum clear distance of 12 inches from any bell joint or between taps on a main line. No service taps shall be performed by the Contractor on any waterline that has been accepted by the owner and is in active service.

- C. All direct service taps shall be made with a drilling and tapping machine intended for use on ductile iron pipe as manufactured by Mueller or approved equal. The drilling and tapping machine shall have alignment tool guides and a placement strap. Direct threaded taps shall engage a minimum of four (4) full threads. Hand held equipment is not allowed. Coupons shall be removed from pipe.
- D. Direct taps shall require the use of two (2) layers of 3 mil tetrafluoroethylene (TFE) tape on the threads of the corporation stop. Liquid TFE will not be allowed. Direct taps for 1 inch services are allowed only on mains that are 6 inches in diameter or larger. Swing joints shall be installed on all 2 inch services in accordance with Standard Drawings W1.04 through W1.07.

3.4 Piping

- A. Install service tubing as shown on the Plans or as specified elsewhere in these Contract Documents. Cut service pipes using tools specifically designed to leave a smooth, even, and square end on the material being cut. Ream cut ends to the full inside diameter of the pipe. Clean pipe ends to a sound, smooth finish prior to using compression connections which seal to the outside surface of the pipe.
- B. All long services constructed across public or private rights-of-way or vehicular travel ways shall be installed inside a minimum 3 inch Schedule 40 PVC duct or SDR 13.5 HDPE sleeve at the locations shown on the plans and in accordance with the Standard Drawings.

3.5 Corrosion Protection

Cathodic protection items, when required, shall be in accordance with Standard Drawings W1.22 through W1.22.3, including dielectric insulating corporation stops, dielectric insulating joints, tape wrap, and grounding rod.

3.6 Reconnecting Existing Services

The Owner will connect all existing service lines at meters, to new service runs or to new water main as shown, and as required.

3.7 Flushing and Disinfection

Flush and disinfect all service connections and appurtenances in accordance with Section 33 13 00 Pipeline Testing and Disinfection.

END OF SECTION