

SECTION C4

SERVICE LINES

GENERAL

The work under this section shall be the replacement of existing service lines (fire or domestic) and installation of new service lines both in public and private property.

All service lines fed from the water main being replaced must be reconnected to the new water main unless otherwise directed by the Engineer. The Commission specifies that all services 2-inches, and smaller be copper and all services greater than 2-inches, be ductile iron.

Existing service pipe material may be lead, galvanized iron, cast or ductile iron, plastic or copper.

MATERIALS

The materials for all service lines 4-inches and larger shall be in accordance with Section C1, Ductile Iron Pipe and Fittings and Section C2, Valves and Appurtenances. Materials for all service lines 2-inches or less shall be in accordance with the following:

- a. Copper Tubing shall be soft, annealed, seamless tubing conforming to Federal Specifications WW-T799A, Type "K".
 1. To minimize joints, coiled tubing shall be used.
 2. Joints in copper tubing shall be made with three part compression couplings, flared tube fittings (ASA spec. B-16), or an approved equal. All fittings shall be electrically conductive.
- b. Corporation Stops:
 1. Shall be cast bronze ball valves, conforming to the latest ASTM specification for Steam or Valve Bronze Castings, Serial Designation B62.
 2. Shall be equal in size to the stop being replaced, with 3/4 inch being the minimum size.

3. For 2-inch service lines shall be 1 1/2-inch stops fitted with a 2-inch outlet adaptor or shall be 1 1/2-inch stops with 2-inch outlets.
 4. Shall be a ball valve with a full round smooth waterway, which operates freely. It shall meet all the requirements of AWWA C800. The valve shall be equipped with a removable tee head, which can be attached to the operating head of the valve after tapping. The tee head shall be a minimum of 1-inch in height. The valve shall open to the right.
 5. Shall be tested under a hydrostatic pressure of 250 pounds per square inch and found to be tight before leaving the factory.
 6. Shall have Standard Threads on the inlet and all other threads shall be American Standard Wrought Iron Pipe Threads.
- c. Roadway service boxes, where required, shall have a minimum inside diameter of 4 1/4 inches, shall be coated with asphaltum and shall be approved by the Commission prior to installation.
- d. Service shoes and caps, where required, will be supplied by the Commission. PVC tubes are acceptable.
- e. Curb Stops:
1. Shall be cast iron bronze, conforming to the specification above for corporation stops.
 2. Shall be equal in size to the new copper pipe, which the stop is connected to.
 3. Shall have full, round, smoothed, reamed waterway and shall operate freely as adjusted for testing.
 4. Shall be a ball valve conforming to AWWA 800 with a one-piece tee head and shall open to the right.
 5. Shall be rated at 250 psi or greater.
- f. Sidewalk Boxes:

1. Shall be heavy weight, light gray cast iron, true to pattern, and free from flaws.
2. Shall have length of the two sections at least 70 inches.
3. Shall have a total weight of approximately 40 pounds.
4. Shall have a threaded plug, which may be removed to operate the stop.
5. Shall be thoroughly coated with two coats of asphaltum varnish.

CONSTRUCTION METHODS

- a. In locations where the existing service line is determined to be adequate by the Engineer, it shall be reconnected to the new water main using a new corporation stop, shoe, tube, and cap. This observation shall be made by the Engineer. If copper pipe is found at the main, the Contractor shall excavate in the sidewalk area to determine if the pipe is still copper. If not then the entire service shall be relaid. All excavation to determine service pipe material shall be paid for under the item for miscellaneous excavation.
- b. Existing service lines over 2-inches and up to and including 4-inches shall be replaced with 4-inch ductile iron pipe, using reducers as required and connected to the existing service line unless otherwise noted on the contract drawings or directed by the Engineer.
- c. All new copper service lines shall be connected to the existing service line at the property line. In the event that an area sidewalk foundation wall or other subterranean structure exists at the property line, the connection shall be made as close as possible to it and at a maximum 18 inches away from the same.
- d. All new ductile iron service lines shall be connected to the existing service line within 18 inches of the property line, area sidewalk, foundation wall, or other subterranean structure.

e. Service Line:

1. Shall be installed in accordance with all applicable portions of Section C1, Ductile Iron Pipe and Fittings.
2. Shall be a minimum of 3/4 inch in diameter.
3. Shall have a minimum depth of cover of 5.5 feet.

f. Corporation Stops:

1. Shall be threaded into a tap in the main at the horizontal diameter of the main.
2. Shall have the tap made in the main by means of a tapping machine manufactured for this purpose and supplied by the Contractor. The tap and drill shall be kept sharp and shall have standard threads unless otherwise approved by the Commission.
3. Shall be screwed firmly into the water main with the key upward and the inlet end projecting at least 1/8 inch beyond the inside face of the main.
4. Shall be left in the on (open) position.
5. 3/4-inch and 1-inch shall be fitted with a service shoe, tube and cap.
6. 1½-inch and 1½-inch by 2-inch shall be fitted with a roadway service box.

g. Curb stops:

1. Shall be installed on ¾-inch and 1-inch service lines.
2. Shall be deleted on service lines when the main is in the sidewalk area, and all corporation stops, including ¾-inch and 1-inch, shall be fitted with sidewalk control boxes.
3. 3. Shall be set in a bed of clean gravel or approved material of equal draining qualities.

All service connections shall be tested for strength and tightness before being backfilled; they shall be tested under the normal pressure in the water mains to which they are connected,

and any signs of leakage or evidence of failure shall be promptly repaired by the Contractor at his own expense. The Contractor shall furnish all apparatus, material, and labor for making the tests. The water required for testing shall be furnished by the BWSC, without charge to the Contractor, from the Commission's existing water system.

The Contractor shall also be responsible for removing any sediment deposit which may accumulate and impede the full flow of water when restoring the water service from the corporation stop to and through the customer's water meters.

Service lines shall be chlorinated in accordance with the applicable parts of Section C1, Ductile Iron Pipe and Fittings.

MEASUREMENT AND PAYMENT

Item C4-1	Set ¾-inch corporations stop	Each
Item C4-2	Set 1-inch corporations stop	Each
Item C4-3	Set 1½-inch Corporation stop	Each
Item C4-4	Set 1½-inch x 2-inch corporation stop	Each

The number of corporation stops to be paid for under the appropriate item by size shall be the actual number furnished and installed by the Contractor in accordance with these specifications.

All excavation and backfill work required for the installation of any corporation stops shall be considered incidental and no separate payments will be made under any other items.

The unit price paid for corporation stops shall be full compensation for tapping the main, furnishing and setting the corporation stop, removal and reset (or setting of Commission supplied) corporation shoe, removal and reset of cap or roadway box (where applicable), removal and disposal of existing corporation stop and access tube, furnish and set new access tube, furnish and set whatever coupling may be required to connect the new corporation stop to the existing copper service, and all other work involved for which there is no separate payment item.

Corporation stops set in conjunction with the installation of a pitometer tap shall be paid for under Item C5-1.

Item C4-5	Lay ¾-inch copper tubing	L.F.
Item C4-6	Lay 1-inch copper tubing	L.F.
Item C4-7	Lay 1 ½-inch copper tubing	L.F.

Item C4-8 Lay 2-inch copper tubing L.F.

The length of copper service pipe to be paid for under the appropriate size designated shall be measured by the linear foot along the finished grade over the pipe from the corporation stop key to the point of interception with the existing service pipe. No deduction will be made for curb stops or couplings. Separate measurements will be made for each service.

The unit price paid for copper tubing shall be full compensation for earth excavation and backfill (as detailed in Section A1), furnishing, and laying copper tubing, removal and disposal of existing service line, connecting to existing service line including any adaptor which may be required, furnish and set curb stops (where required) including drainage material, furnish and set service boxes and covers (where required), and all other work for which there is no separate payment item.

SERVICES ON PRIVATE PROPERTY

General

The Contractor shall be required to replace lead service pipe in private property at locations noted in this contract and as required by the Engineer. The locations noted in the Special Conditions are those believed by the Commission to be lead. Other locations may be found during the course of the pipe replacement.

As part of the Commission's program to remove lead pipe from the distribution system lead services are to be replaced with copper when located during the installation of main line pipe and service pipes under Commission contracts. The Commission will be responsible for communicating with the building owner and receiving a damage waiver from the property owner prior to entry by the Contractor.

The Contractor shall replace existing lead piping from the property line into the building to the existing meter or where directed by the Engineer. The work will include setting a new ball valve on the public side of the meter and setting new meter couplings. The ball valve will be affixed to the piping with a flared or compression fitting. The annular space between the new copper pipe and the wall shall be filled with non-shrinking grout sealing out all moisture. All interior connections shall be made using sweat or compression fittings. The Contractor is also required to disconnect and reconnect all electrical grounding wires in accordance with all applicable laws and regulations governing electrical service.

MATERIALS

Ball valves shall meet the requirements of AWWA C800. Meter couplings shall be supplied by the Commission.

MEASUREMENT AND PAYMENT

Item C4-5P	Lay 3/4-inch cu.on private property	L.F.
Item C4-6P	Lay 1-inch cu.on private property	L.F.
Item C4-7P	Lay 1 1/2-inch cu.on private property	L.F.
Item C4-8P	Lay 2-inch cu.on private property	L.F.

The length of copper service pipe to be paid for under the appropriate size designated shall be measured by the linear foot along the finished grade over the pipe from the property line to the meter coupling. Separate measurements will be made for each service. Prices for these items have been set by the Commission.

The unit price paid for copper tubing shall be full compensation for earth excavation and backfill (as detailed in Section A1), furnishing, and laying copper tubing, removal and disposal of existing service line, connecting to existing service pipe or couplings, furnishing and setting a new ball valve, setting new meter couplings and detaching and reconnecting electrical ground wires and all other work for which there is no separate payment item.

Where the contractor disturbs private property he shall only be responsible for normal trench backfill under the appropriate items except where required to place a 3-inch layer of new graded loam within the limits of the disturbed area. Payment for the loam and placement will be in accordance with item L1-2, Landscaping and shall be made at the set unit price per square yard of material provided and set.

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