

**SECTION 02646**

**SERVICE LINES, METERS AND APPURTENANCES**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section concerns materials and installation of corporation stops, curb stops, service lines, meters, meter setters, meter pits and appurtenances.

1.2 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Products shall be handled, stored, and protected in a manner which will prevent damage to materials, coatings and finishes.
- B. All material shall be kept clean and free from dirt.

1.3 INSTALLATION OF SERVICE TAPS

- A. Reference Typical Detail Drawing No. 11 for 5/8 x 3/4-inch through 2-inch services.
- B. Contractors licensed by City for utility work in the public right-of-way shall be allowed to make service taps on new water mains which have been initially accepted.
- C. Contractor shall not make service taps on existing water mains without permission from the Engineer/Utility.
  - 1. Utility may authorize Contractor to make service taps or to use a licensed or authorized tapping Contractor to make service taps on existing mains. A Utility representative will observe the tapping operation.
  - 2. The Utility shall be notified twenty-four (24) hours before making a tap.
- D. Utility reserves the right to make taps in lieu of Contractor and the right to deny permission for any main to be tapped.
- E. Tapping equipment shall be of good quality, used for the purpose intended and used in accordance with manufacturer's instructions.
  - 1. Reference Section 01600.
- F. Service taps on mains larger than 12-inch will be made only under direct supervision of the Utility.
  - 1. All service taps made on cathodically protected mains shall use service line

insulating fittings.

- a. See Typical Detail Drawing No. 26.
  - b. Fittings will be tested by the Utility for continuity.
2. Contractor shall give forty-eight (48) hours notice to the Engineer/Utility before a tap is to be made.
- G. All  $\frac{3}{4}$ -inch and 1-inch taps, on ductile iron pipe, shall be installed by direct tapping.
- H. On ductile iron pipe, 1  $\frac{1}{2}$ -inch and 2-inch taps shall be installed by one of the following methods:
1. Taps on new construction shall be a mechanical joint tapped tee with an iron pipe thread inlet corporation.
  2. Taps on existing lines shall be made with a tapping saddle.
- I. Service connections larger than 2-inch shall be installed by one of the following methods:
1. On new construction, connection shall be a mechanical joint tee with gate valve (Minimum size 4-inch) installed at tee.
  2. On existing mains, connection shall be made with a wet tap (Minimum size 4-inch).
    - a. Utility shall make tap, or
    - b. Utility may authorize a licensed or authorized tapping contractor to make tap. Utility representative will observe the tapping operation.
  3. Reference Section 02713.
- J. Unless otherwise approved by Utility, all taps on plastic pressure pipe shall be made with a tapping saddle in accordance with manufacturer's recommendations.

#### 1.4 MAINTENANCE AND CORRECTION

- A. Contractor shall maintain and repair all service lines, meter pits, copperhorns, coppersettlers and any associated appurtenances which leak, were installed incorrectly, or otherwise prove to be defective, for a period of two (2) years after final completion and acceptance of the work.

#### 1.5 METER SETTERS

- A. Contractor shall furnish meter setters for  $\frac{5}{8}$  x  $\frac{3}{4}$ -inch, 1-inch, 1  $\frac{1}{2}$ -inch, and 2-inch

meters.

1. Single family and duplex residential buildings may utilize interior or exterior meter settings.
  - a. Single family and duplex residential buildings with fire lines shall use exterior meter settings. The fire line connection shall be downstream of the meter box.
  - b. No meters shall be installed in crawl spaces.
2. Multi-family residential buildings shall use exterior meter settings.
3. Commercial buildings shall have meters installed as follows:
  - a. All 5/8 x 3/4-inch and 1-inch meters may use an exterior or interior meter setting, at the option of the Developer.
  - b. All 1 1/2-inch and larger meters shall use an exterior setting.
4. Interior meter settings shall be installed in accordance with Typical Detail Drawing No. 14.
5. Exterior meter settings for 5/8 x 3/4-inch and 1-inch meters shall be installed in accordance with Typical Detail Drawing No. 15.
6. Exterior meter settings for 1 1/2-inch and 2-inch meters shall be installed in accordance with Typical Detail Drawings No.16-A and 16-B .

#### 1.6 METER BOXES (3/4 AND 1 INCH METERS)

- A. Contractor shall install 5/8 x 3/4-inch and 1-inch meter boxes.
  1. Meter boxes shall be a minimum of 20-inches in diameter, a minimum of 48-inches in length.
    - a. Reference 2.10.A of this section.
  2. Meter box covers shall be constructed of cast iron with cast iron recessed lids and rubber or plastic inner lids.
    - a. Reference 2.10.B of this section.
  3. Meter boxes shall be installed in accordance with Typical Detail Drawing No. 15.

#### 1.7 METER PITS (1 1/2 AND 2-INCH METERS)

- A. Contractor shall install 1 1/2-inch and 2-inch meters pits.

1. Meter pits shall be constructed from standard 48-inch inside diameter precast concrete manhole sections.
  - a. Reference Section 03400 and 2.11.B of this section.
2. Meter pit covers shall be an aluminum manhole ring and cover with a 24-inch diameter opening.
  - b. Reference 2.11.C of this section.
  - b. All meter pit covers shall have a 27/32-inch worm-lock with a Standard Waterworks pentagon head.
  - c. All meter pit covers shall have the word "water" cast in the lid.
  - d. Meter pits shall be installed in accordance with Typical Detail Drawings No. 16-A and No. 16-B.

#### 1.8 METER VAULTS (3" AND LARGER METERS)

A. Contractor shall install 3-inch and larger meters and meter vaults.

1. Meter pits and vaults shall be constructed from precast concrete box sections designed for H-20 bridge loading.
  - a. Minimum interior vault dimensions for different size meters shall be as noted on Typical Detail Drawings No. 17-A and 17-B.
2. Unless otherwise specified, meter vault covers shall be an aluminum manhole ring and cover with a 24 inch diameter opening.
  - a. All meter vault covers shall have a 27/32-inch worm-lock with a Standard Waterworks pentagon head.
  - b. All meter vault covers shall have the word "Water" cast in the lid.
  - c. All meter vaults shall be installed in accordance with Typical Detail Drawings No. 17-A and 17-B.

### PART 2 - PRODUCTS

#### 2.1 TAPPING SADDLES

- A. Tapping saddles for 2-inch and smaller services shall have either a bronze or brass body with bronze double flat straps and bronze nuts.
1. Outlet threads on tapping saddles shall be "cc" type.

2. Acceptable manufacturers of tapping saddles are:
  - a. Mueller.
  - b. Ford.
  - c. No substitutions will be allowed.

## 2.2 CORPORATION STOPS

- A. All corporation stops shall conform to AWWA C800.
  1. All corporation stops shall be constructed of brass.
  2. Corporation stop inlet threads for tapping saddles shall be "cc" type.
  3. Corporation stop inlet threads for tapped tees shall be IP type.
  4. All corporation stop outlets shall use a compression connection.
  5. All corporation stops shall be ball type valves only.
  6. Corporation stops shall be used for all taps which are 2-inches and smaller.
  7. Corporation stops shall have uniform size on inlet and outlet.
- B. Acceptable manufacturers of corporation stops are:
  1. Mueller; #B25008.
  2. Ford (quick joint coupling only); #FB1000-Q.
  3. A. Y. McDonald; #4701BQ.
  4. No substitutions will be allowed.

## 2.3 COPPER SERVICE LINES

- A. Copper pipe shall be used for service lines which are 2-inches and smaller.
- B. All copper services shall conform to the Appendix to AWWA C800.
  1. The copper for copper services shall be Type K.

## 2.4 COUPLINGS

- A. All couplings shall use a compression connection.

B. Acceptable couplings are:

1. Mueller; #H-15403.
2. Ford (quick joint coupling only); C44-Q.
3. A. Y. McDonald; #4758Q.
4. No substitutions will be allowed.

## 2.5 CURB STOPS

A. All curb stops shall have compression connections at both ends.

B. Top threads for all curb stops shall be Minneapolis type.

C. Curb stops shall be used for services which are 2-inches and smaller.

D. Curb stops shall be ball type valves only.

E. Acceptable 3/4-inch and 1-inch curb stops are:

1. Mueller; B25155 (with Minneapolis threads).
2. A. Y. McDonald; #6104Q.
3. Ford; B44-MQ (quick joint coupling only).
4. No substitutions will be allowed.

F. Acceptable 1 ½-inch curb stops are:

1. Mueller; B25155 (with Minneapolis threads), with two #H-15428 ends.
2. A. Y. McDonald; #6104Q.
3. Ford #B44-MQ (quick joint coupling).
4. No substitutions will be allowed.

G. Acceptable 2-inch curb stops are:

1. Mueller; B25155 (with Minneapolis threads).
2. A. Y. McDonald #6104Q.
3. Ford #B44-MQ (quick joint coupling).

4. No substitutions will be allowed.

## 2.6 CURB BOXES FOR CURB STOPS

- A. Minneapolis pattern base shall be used for all curb stops.
- B. Acceptable curb boxes are:
  1. Mueller; #H-10302.
  2. No substitutions will be allowed.

## 2.7 VALVES AND VALVE BOXES FOR 3-INCH AND LARGER SERVICES

- A. Reference Section 02641

## 2.8 METERS AND STRAINERS

- A. All meters and strainers shall be purchased from the Utility unless otherwise specified.
- B. Acceptable meters and strainers are:
  1. Schlumberger/Neptune.
  2. Invensys/Sensus/Rockwell.
  3. Badger.
  4. No substitutions will be allowed.

## 2.9 METER SETTERS

- A. All multi-family buildings shall use exterior meter settings.
- B. Acceptable 5/8 x 3/4-inch copperhorns (interior meter settings) are:
  1. Ford #CH88-233 with B-11-233 ball valve on each end with HB-2 handles on both valves and 1/4-inch tag mounting hole in both handles.
  2. A.Y. McDonald #M43-2 MM33 M style with 6101 ball valve on each end with 6120 handle on both valves and 1/4-inch tag mounting hole in both handles.
  3. No substitutions will be allowed.
- C. Acceptable 5/8 x 3/4-inch coppersettors (exterior meter settings) are:
  1. Ford #V82W-44-33

2. Mueller #H-1440 with ¾-inch 110 compression connections.

3. No substitutions will be allowed

D. Acceptable 1-inch copperhorns (interior meter settings) are:

1. Ford #CH88-444 with B11-444 valve on each end with HB-34S handle on both valves and ¼-inch tag mounting hole in both handles.

2. Mueller #H1412 with H14233 end connections and with B-20200 valves on each end with B20298-99000 handle on both valves and ¼-inch tag mounting holes in both handles.

3. No substitutions will be allowed.

E. Acceptable 1-inch coppersettors (exterior meter settings) are:

1. Ford #V84-44-44 pack joint type

2. Mueller #H1440 with 1-inch 110 compression #H15451

3. No substitutions will be allowed.

F. Acceptable 1 ½-inch and 2-inch meter settors are:

1. Ford.

a. 1 ½-inch, #VVF6612B-13.

b. 2-inch, #VVF7712B-17.

2. Mueller.

a. 2-inch, #H-1423.

3. No substitutions will be allowed.

## 2.10 METER BOXES

A. Acceptable 5/8 x 3/4-inch and 1-inch meter boxes are:

1. DFW Plastics #DFW 20 x 48.

2. Mid States Polyethylene, # 20 x 48

3. No substitutions will be allowed.



B. Acceptable meter box covers and lids for 5/8 x 3/4-inch and 1-inch meter boxes are:

1. Ford; #W3 cover with a WA3L-TP lid.
2. No substitutions will be allowed.

C. Acceptable 3-inch meter box extensions for 5/8 x 3/4-inch and 1-inch meters are:

1. DFW Plastics, DFW-203R
2. Mid States Polyethylene, 81R03.

3. No substitutions will be allowed.

## 2.11 METER PITS AND VAULTS

A. Reference Section 03400

B. Acceptable meter pits and vaults for 1 ½-inch and larger meters are:

1. AMCOR Precast
2. An approved equal.

C. Acceptable meter pit and vault covers for 1 ½-inch and larger meters are:

1. Casting Incorporated #MH-125-24 AL-WATER.
2. No substitutions will be allowed.

## PART 3 - EXECUTION

### 3.1 GENERAL

A. The Contractor shall make all taps and install the service line to the curb stop prior to disinfection and pressure testing of the water main.

B. The Contractor shall adjust stop boxes, meter pits and meter boxes to horizontal location and to final grade as determined by a grade stake.

1. Grade stakes shall be placed a minimum of five feet from the location of the stop box.
2. Grade stakes shall not be disturbed prior to inspection of the service by the Engineer.

C. The Contractor shall mark the location of the water service with a cross cut into the

face of the curb and gutter.

1. Reference Typical Detail Drawing No. 11.

### 3.2 CORPORATION STOPS

- A. Taps shall not be made within two feet of any joint or fitting.
- B. Taps shall be separated by a minimum of two feet (measured along the pipe length), even when taps are made on opposite sides of pipe.
- C. Taps which are made on the same side of the pipe and within 10 feet of each other (measured along the pipe length), shall be staggered fifteen degrees.
- D. Taps made to plastic pressure pipe shall be made in accordance with the manufacturer's recommendations.
  1. Use tapping saddles only.
  2. Use shell cutters to make opening in pipe.

### 3.3 SERVICE LINES

- A. All service lines shall be a minimum of 54 inches and a maximum of 66 inches below the final grade.
- B. There will be a maximum of one coupling per service, between the main and the curb stop.
  1. Service lines (3/4-in. through 2") shall be uniform in size from the corporation stop to 5 feet past the meter.
  2. An exterior meter setting will be required if the customer's service line is not uniform in size from the corporation stop to the building.
- C. When backfilling the service trench, sand shall be used under and 6-inches above the goose neck at the service connection.
  1. Sand shall conform to ASTM C 33.

SIZE	PERCENT PASSING
1"	100
3/4"	90-100
3/8"	20- 55
#4	0- 10
#8	0-5

D. Service trenches shall be subject to compaction specifications.

1. Reference Section 02221.

### 3.4 CURB STOPS

A. The Contractor shall adjust the curb stop box to ½-inch above final grade prior to final inspection.

B. Curb stop box shall be screwed onto the curb stop.

C. Curb stop box shall be plumb, so that a shut-off key can be placed on the curb stop.

D. Major landscaping (shrubs, boulders, etc.) and structures (retaining walls, fences, buildings, etc.) shall not be placed within four (4) feet of the curb stop box.

3. Trees shall not be planted within ten (10) feet of the curb stop box.

E. If the grade of the ground surrounding the curb stop box is changed, after the curb stop box has been installed, the curb stop box cover shall be adjusted to ½-inch above final grade.

### 3.5 EXTERIOR METER SETTINGS

A. Exterior meter settings shall be installed by the Contractor according to the manufacturers recommendations, and in accordance with Typical Detail Drawings No. 15, 16-A, 16-B, 17-A, or 17-B.

1. 5/8 x 3/4-inch, 1-inch, 1 ½-inch, and 2-inch meters shall be installed by the Utility upon inspection and acceptance of the meter setting.

2. 3-inch and larger meters are issued by the Utility to be installed by the Contractor prior to inspection and acceptance.

B. Meter pits and vaults shall not be installed in any street, alley, parking area, driveway, or sidewalk.

C. Major landscaping (shrubs, boulders, etc.) and structures (retaining walls, fences, buildings, etc.) shall not be placed within four (4) feet of any meter box, pit or vault.

1. Trees shall not be planted within ten (10) feet of any meter box, pit or vault.

D. The ground surrounding meter boxes, pits and vaults shall slope away from the lid at a minimum grade of 2%.

E. No plumbing connections will be allowed inside the meter box, pit or vault.

- F. All tees, connections, and couplings shall be a minimum of five (5) feet downstream from the meter box, pit, or vault wall on the outlet side.
  - 1. Tees and connections shall not be installed between the curb stop and the meter setter or copper horn.
- G. If the grade of the ground surrounding the meter box, pit or vault changes after the installation, the cover shall be adjusted to ½ inch above the final grade by the property owner.
- H. Meter boxes, pits, or vaults shall not be covered or enclosed as to inhibit meter reading or meter maintenance.

### 3.6 INTERIOR METER SETTINGS

- A. Interior meter settings shall be installed by the Contractor in accordance with Typical Detail Drawing No. 14.
  - 1. The meter, readout wire and readout shall be installed by the Utility upon inspection and acceptance of the meter setting.
- B. If the water service enters the house through the floor, a minimum of 4 inches of concrete or 24 inches of soil shall cover the water service from the edge of the foundation to the vertical riser.
  - 1. The meter setter shall be installed in a heated portion of the building.
  - 2. Services shall be insulated from direct contact with concrete or other abrasive surfaces.
- C. Copper horns shall not be placed in a crawl space.
- D. All copper horns shall be installed so that the meter is in a horizontal position.
  - 1. The copper horn shall not be installed above a hot water heater.
- E. A clear and unobstructed access of not less than 24 inches by 24 inches shall be provided so that the copper horn can easily be reached.
- F. There shall be no tees or connections made between the water main and the meter.
- G. A ½-inch, or larger, conduit shall be installed from the meter setter to the remote reading point.
  - 1. The conduit shall be EMT only.

2. There shall be no more than 75 feet of conduit between pull boxes.
  - a. There shall be no more than 4 (four) 90-degree bends between pull boxes.
  - b. All pull boxes must be installed no more than 96 inches above the floor.
  - c. Pull boxes shall not be installed in attics or crawl spaces.
3. The remote reading point shall be a two (2) inch deep recessed electrical box with a blank metal cover.
  - a. The recessed electrical box shall be mounted on the outside wall of the building, 48 to 66 inches above the ground, within 4 feet of the electrical meter, and between the electrical meter and the front of the building.
  - b. The remote reading point shall not be covered or enclosed as to inhibit meter reading or meter maintenance.

### 3.7 SERVICE AND TAP INSPECTION

- A. The Contractor shall insure that the curb stop, corporation stop, and any couplings remain exposed until after the inspection and the approval for backfill is given by the Engineer.
- B. All tap and service inspections shall be scheduled with the Engineer.
  1. Without exception, a minimum of twenty-four (24) hours notice is required on all tap and service inspections.

### 3.8 METER INSPECTIONS

- A. All water fees shall be paid prior to inspection.
- B. A minimum of 48 hours notice is required on all meter inspections.
- C. All water meter inspections shall be scheduled through the Utilities Water Meter Shop.
  1. The Owner shall be billed for re-inspections.
- E. Inspection of 3-inch and larger meters shall be made within 30 days of the issuance of the meter to the Owner or Contractor.

**END OF SECTION**