SECTION 02553

WATER SERVICES, WATER METER SETTINGS, AND VAULTS

02553.01 GENERAL

A. Description

Water services, water meter setting, and vault installation shall include, but not necessarily be limited to, furnishing, and placing water services with appurtenant meter housings and connection to the water main in accordance with the Contract Documents.

B. Related Work Included Elsewhere

1. Trench excavation, backfill, and compaction; Section 02250.
2. Water main installation and chlorination; Section 02551.
3. Water valve and appurtenant installation; Section 02552.
4. Cast-in-place concrete; Section 03300.
5. Precast concrete utility structure installation; Section 03400.

C. Quality Assurance

1. Materials

   The Engineer will inspect all materials before and after installation to ensure compliance with the Contract Documents.

2. Field Tests

   Water services and water meter settings will be visually inspected for leakage by the Engineer at the existing water main line pressure before the excavation is backfilled. The corporation stop, valves, meter setting, tubing, piping, and connections shall be leak free under line pressure.

D. Submittals

1. Shop Drawings

   Shop drawings shall be submitted as specified in the "General Provisions" for the following materials, and include the following information:

   a. Aluminum access hatches: product description, parts and materials list, and load rating.

b. Water meters larger than 2-inch and 5/8-inch to 2-inch meter setting appurtenant: materials list naming manufacturer, model number, and any applicable options specified herein.

c. Couplings for 3-inch or larger meter settings: product description and parts and materials list.

2. Certificates of Compliance

Certificates of compliance shall be submitted as specified in the "General Provisions" for the following:

a. Contractor furnished meters: stating the manufacturer has tested the meter for accuracy of registration and that it complies with the accuracy requirements of the applicable AWWA standard.

b. Polyethylene tubing: stating that all materials comply with the requirements of AWWA C901 as modified herein.

02553.02 MATERIALS

A. Materials Furnished by the County

1. The County will furnish and install meters for all 3/4-inch through 2-inch water service connections.

2. The County will famish and install meter appurtenances for 3/4-inch through 2-inch water service connections only when specified in the "Special Provisions".

B. Contractor's Options

1. The Contractor may furnish copper tubing, for 3/4 through 2- inch water services. Polyethylene tubing is only permitted for water services in corrosive environments.

2. The Contractor may furnish precast concrete or plastic water meter vaults for 3/4- inch (single and twin meter settings) and 1-inch water services.

3. For SHA projects, Contractor to furnish copper piping for water services.

C. Detailed Material Requirements

1. Water Meters

a. Water meters for 1-1/2 inch through 6-inch diameters to be Sensus Omni C^2 meters with test plug. These meters are for domestic service only; combined fire service or separate domestic/fire service meters are listed below.

b. Residential and commercial sprinkler systems shall be sprinkled using the appropriate meter that will read across the range of domestic and fire flow. There will be no sprinkler systems that are unmetered. A monitoring agreement is not a substitute for a meter.

c. Water meters for either combined domestic and fire service or commercial-domestic service only shall be bronze, magnetic drive, flanged end turbo meters with hermetically perma-seal glass and housing, test plug, registering in U.S. gallons, and furnished with a U.L. approved fire strainer, as manufactured by Sensus, as follows:

1) 4-inch, Model Omni F^2, flow range 1.5 gpm minimum to 1,000 gpm maximum for use on commercial properties only; combination meter to read domestic and fire flows.

2) 6-inch, Model Omni F^2, flow range 3 gpm minimum to 2,500 gpm maximum for use on commercial properties only; combination meter to read domestic and fire flows.

3) 8-inch, Model Omni F^2, flow range of 3.5 gpm minimum to 3,500 gpm maximum for use on commercial properties only; combination meter to read domestic and fire flows.

4) 10-inch, Model Omni F^2, flow range of 5 gpm minimum to 5,500 gpm maximum for use on commercial properties only; domestic and fire flows.

5) 8-inch, Model Omni C^2, flow range of 3.5 gpm minimum to 2,700 gpm maximum for use on commercial properties only; to read domestic flows.

6) 10-inch, Model Omni C^2, flow range of 5 gpm minimum to 4,000 gpm maximum for use on commercial properties only; to read domestic flows.

7) 8-inch, Model Omni T^2, flow range of5 gpm minimum to 3,500 gpm maximum for use on commercial properties only; to read domestic flows.

8) 10-inch, Model Omni T^2, flow range of 6 gpm minimum to 5,500 gpm maximum for use on commercial properties only; to read domestic flows.

2. Water Service

a. Copper tubing shall be Type K, annealed, and shall meet the material,

chemical, and mechanical requirements of ASTM B 88.

3. Service pipes and fittings 3-inch diameter and larger for water shall be as specified in Section 02551.02.

4. Gate valves, roadway valve boxes, and tapping sleeves for water services shall be as specified in Section 02552.02.

5. Pipe for meter support in 2-inch metered water supplies shall be galvanized steel as specified in Section 02552.02 or schedule 40 PVC.

6. Corporation stops with coupling or compression type nuts shall be Mueller Catalog Numbers H-15000, H-15008, or H-15013, or equal.

7. Tubing Couplings
   a. Copper tube couplings shall be Mueller Catalog Number H-15405 two-part union, or equal.

8. Meter pit frames, lids, and covers.
   a. Frame and Cover: In nontraffic areas frame and lid to be Ford model A32-T with worm lock assembly or approved equal. In traffic areas, frame and lid shall be Ford model A32HH-T with worm lock assembly or approved equal.

   b. Monitoring Frame and Cover: In nontraffic areas frame and lid to be Ford model MC-24-TT with worm lock assembly or approved equal. In traffic areas, lid shall be Ford model RML-12 with worm lock assembly or approved equal.

9. Meter setting fittings, yokes, and appurtenances for 3/4 through 2-inch metered water supplies, including dual angle check valves, shall be manufactured by the Ford Meter Box Company, or approved equal.
   a. Metter setter assembly for 3/4" Metered Domestic Water Supply Service, Single and Twin Setting, per Standard Detail W-21 and W-22, shall be factory assembled model Y-501(P) or approved equal.

   b. Metter setter assembly for 1" Metered Domestic Water Supply Service, Single and Twin Setting, per Standard Detail W-23, shall be factory assembled model Y-503(P) or approved equal.

   c. Metter setter assembly for 1-½" Metered Water Supply Service, Single Setting, 1” Meter, per Standard Detail W-25 shall be factory assembled model B 95141-09 or approved equal.

   d. Metter setter assembly for 1-½" Metered Water Supply Service, Twin Setting, 1” Meters, per Standard Detail W-25A shall be factory assembled model B 95141-10 or approved equal.

e. Metter setter assembly for 2" Metered Water Supply Service, 2" Meter, per Standard Detail W-26 shall be factory assembled special setter with high bypass model VHH77-18HB-11-77 with 13” spacing for 2” turbo meters or approved equal.

10. Aluminum access hatches for 3-inch or larger meter vaults shall be designed to withstand a live load of 300 pounds per square foot or a H-20 wheel load when specified in the Contract Documents. Door leaf shall be 1/4-inch aluminum diamond or safety tread pattern plate. Channel frame shall be 1/4-inch aluminum with concrete anchor flange around the perimeter, bituminous coated where in contact with concrete, and a 1 1/2-inch drainage coupling. Doors shall be equipped with brass hinges, stainless steel pins, spring operators, and an automatic hold-open arm with release handle. The door shall have a snap lock with a removable handle. The door shall be operable by a force not to exceed 30 pounds. Access hatches shall be Bilco model J-4AL, or equal.

11. Pipe couplings for 3-inch or larger meter settings shall be a gasketed, sleeve-type. Couplings shall consist of one steel middle ring, two steel followers, two rubber-compounded wedge section gaskets suitable for use with potable water, and sufficient track-head steel bolts to compress the gaskets. Couplings shall be factory coated with fusion bonded epoxy.

12. Tapping saddles shall be manufactured of high tensile ductile iron, ASTM A 536, protected with a fusion applied epoxy coating. Saddles shall be furnished with stainless steel straps, with a minimum 2 1/2-inch-wide bearing area, and a rubber gasket suitable for potable water.

13. Portland cement concrete for cast-in-place meter vault lids and bases shall be Mix No. 3 as specified in Section 03310.

14. Concrete reinforcement shall be as specified in Section 03200.

15. Link seals by Thunderline Corporation with stainless steel option for pipe wall penetrations shall be as specified in Section 02562.

16. Precast meter vaults shall be either precast concrete vaults of the size indicated on the Standard Details furnished and installed as specified in Section 03400 or PVC vaults as specified herein. Precast vault shall be manufactured by Mid States Concrete Industries or approved equal.

17. Round prefabricated polyvinyl chloride (PVC) plastic water meter vaults shall be used in high groundwater locations in lieu of precast meter vaults. They shall be manufactured by the Mueller Company or approved equal for the following sizes:

3/4-inch service with single meter	15-inch diameter vault (Model 250 CS l 536LA)

3/4-inch service with twin meters	18-inch diameter vault (Model 250 CD l 836LA)
1-inch service with single meter	18-inch diameter vault (Model 330 CS 1836 LA)

The prefabricated meter vaults shall also comply with the following:

a. Prefabricated water meter vaults shall be furnished with a standard Anne Arundel County Meter Frame and Cover as shown on the Standard Details.

b. The meter setting shall be furnished with a bleed valve and double check valve on the outlet side of the setting.

c. The angle meter valve and angle meter coupling shall be as shown on the Standard Detail to assure interchangeability of County standard meters.

d. The meter yoke will not be required for prefabricated meter vaults using a rigid moveable internal platform, which permits the meter to be raised to the surface for reading and servicing without disconnecting any piping.

18. Brick and concrete masonry units for meter vaults shall be as specified in Section 04200.

02553.03 EXECUTION

A. Water Services, Water Meter Settings, and Vaults

Water services, water meter settings, and vaults shall be installed in accordance with the requirements for the specific materials indicated above, in accordance with the Contract Documents, and the following:

1. Water services shall be installed with a minimum cover of 42-inches.

2. Water services shall be jacked or driven under paving unless otherwise directed by the Engineer. Where open cutting is authorized, trench widths shall not exceed 24 inches. Water services installed in areas other than paving areas may be open cut or driven at the Contractor's option.

3. All services shall be laid to the grade and lines in accordance with the Contract Documents or as directed by the Engineer.

4. All meter vaults shall be set at the location and constructed of the materials shown in the Contract Documents. Grading shall be provided such that the frame and cover is flush around the perimeter with final proposed grades to allow for maintenance and not to create a public safety hazard.

5. Special care shall be taken to ensure that the services are well bedded on a solid foundation. Any defects resulting from settlement shall be repaired by the Contractor at his expense. All meter vaults shall be bedded on firm undisturbed earth. The pipe and fittings shall be thoroughly cleaned before being installed and shall be kept clean until the acceptance of the complete work.

6. All services shall be thoroughly flushed with potable water. Services larger than 2- inch diameter shall be chlorinated as specified in Section 02551.

7. Water services not immediately connected to house service shall be provided with a cap to prevent any foreign matter from entering the pipe. Crimping of service ends will not be allowed.

8. Water services constructed of polyethylene pipe from the main to the meter setting shall provide a copper "water service" tail piece on the house or building side of the meter setting to aid in stability during placement of the meter setting.

9. Meter settings shall be level and the long axis of the setting shall be perpendicular to the proposed curb and gutter or edge of pavement in the case of open section roadways. Where the setting is remote from the roadway the long axis of the meter setting shall be aligned with the centerline of the water service.

B. Connections to Water Mains

1. Service connections to existing water mains shall be made with tapping saddles or sleeves except for connections 1-inch and less to ductile or cast-iron pipe, which may be made by direct tap. Direct taps larger than 1-inch to ductile or cast-iron pipe shall be allowed only where authorized by the Engineer.

2. Service connections to new water mains shall be made by direct tapping ductile iron water mains for up to 1-inch services only, by installing appropriate outlet fittings and valves as the water main is being constructed, or by installing tapping saddles, tees, or sleeves.

3. Corporation taps or tapping sleeves shall be installed on new water mains only after the water mains have been chlorinated and tested in accordance with the Specifications.

02553.04 METHOD OF MEASUREMENT

A. Measurement for water services will be made along the centerline of the tubing or pipe from the centerline of the water main to the center of the meter vault without deduction for fittings.

B. Measurement for meter settings and vaults will be made on the basis of the number of each size and type constructed.

C. Measurement for meter relocations will be made on the basis of the number of each size and type relocated.

02553.05 BASIS OF PAYMENT

A. General

1. Payment will be made at the unit price bid. The price bid shall include furnishing all labor, tools, equipment, and materials necessary to satisfactorily complete the work as shown and specified in strict accordance with the Contract Documents and accepted by the Engineer.

2. The price(s) bid for furnishing and installing water services and appurtenances shall include the following:

    a. Excavation and backfill as specified in Section 02250.

    b. Tapping the main or furnishing and inserting saddles or fittings in the main with appropriate buttresses and furnishing and installing corporation stops or valves at the main.

3. The price(s) bid for furnishing and installing meter settings and vaults shall include furnishing and installing cast-in-place or precast concrete or plastic meter vaults with frames and covers and access hatches as shown on the Standard Details and/or in the Contract Documents.

4. Payment will be made for contingent items when ordered by the Engineer. Payment will be as specified in Sections 02951, 02952, 02953, 02954, 02955, 02956, and 02957.

B. Water Services

Payment for furnishing and installing water services will be made per linear foot of the type and size pipe installed. The price(s) bid shall include driving sleeves, repaving if required, and all items necessary to satisfactorily complete the work.

C. Meter Settings and Vaults

Payment for furnishing and installing meter settings and vaults will be made for each meter type and size installed. The price(s) bid shall include furnishing and placing valves, curb stops, meter yoke, fittings, bypass lines, vault, installation of meter as shown in the Contract Documents, connecting to existing house connections, and all items necessary to satisfactorily complete and make the water service operational. For 3-inch and larger meter settings payment will also include the furnishing of the meter.

D. Meter Relocation

Payment for meter relocations will be made for each meter type and size relocated. In the event new meter vaults, frames and covers, meter yokes, or fittings are required they will be paid for on a force account basis for replacement materials only. The price(s) shall include relocating

salvaged material, installing new material, or revising service connections in accordance with the Contract Documents.

END OF SECTION