SECTION 19

SERVICE ASSEMBLIES

19-1 General

19-1.01 Scope

This section describes the requirements for furnishing and installing service assemblies, both single and double service settings, as an appurtenance to treated water mains. These requirements include the materials to be used, methods and requirements for installation, and measurement and payment.

This section does not include the meter, customer service valve, or any part of the private service line located on the customer-side of the meter assembly.

19-1.02 Description of Work

Work under this section shall include, but not be limited to, excavating (regardless of surface or subsurface conditions), installing the connection to the main, service shutoff valve (if required), service line and fittings, meter valve, meter box slab and wood blocks, meter box with lid and extensions, corrosion protection, installing and testing the locating wire, backfilling including imported material, forming and pouring concrete meter box pads (if required), and restoration of the surface area around the service assembly.

19-1.03 Location

The final location of service assemblies shall be as detailed on the plans or as determined in the field by the District Engineer. Meter boxes for service assemblies shall not be located in areas subject to standing or running water.

19-1.04 Design

Service assemblies shall be designed to meet the requirements of this subsection and all other requirements listed in this section. Service assemblies shall be designed to withstand the working pressures shown on the plans, or a design working pressure of 150 psi, whichever is greater.

Service line size and type, and service shutoff valve requirements shall be as follows:

	Size of Meter	**Service Line Size & Type**		**Service Shut-off Valve***
Single	5/8"x3/4" or 3/4"	1"	PE	Not Required
Double	5/8"x3/4" or 3/4"	1¼"	PE	Not Required
Single	1"	1¼"	PE	Not Required
Single	1½"	2"	PVC	Required
Single	2"	4"	DIP	Required
Single	3" & larger	Per Plans (4" min.)	DIP	Required

PE = Polyethylene Pipe
PVC = Polyvinyl Chloride Pipe
DIP = Ductile Iron Pipe

* The term service shut-off valve identifies the valve located at the water main that controls flow to the service line.

These are general requirements and the final configuration of the meter assembly shall be as shown on the plans. The types of materials and their installation shall be governed by these specifications unless shown otherwise on the plans.

19-1.05 Submittals

Submittals supplied by the Contractor shall include: catalog data for service line material and fittings, compression fittings, branch fitting, meter valve, meter box, lid and slab. Affidavits of Compliance may be required for verification of valve and fitting casting materials, maximum working pressures, and ultimate pressure, and for traffic boxes and lids for H20 loading. All other materials shall be furnished with submittals as described elsewhere in these specifications. The Contractor's attention is directed to the General Conditions of this Contract under "Submittals".

19-1.06 Inspection

The Contractor shall make all service assembly materials available for inspection by the District Engineer prior to installation. Each phase of work shall pass inspection by the District Engineer before commencing work on the next phase. The phases shall consist of, but not be limited to, cutting of pavement, excavation, tapping the water main, installation of the service line, fittings, and locating wire, application of corrosion protection, backfilling, installation of the meter boxes, and surface restoration.

19-2 Materials

19-2.01 General

Materials furnished for service assemblies shall include, but not be limited to, the connection to the main, service line pipe and fittings, meter valve, locating wire, meter box including a lid, extension (if required), concrete for meter box pad, and materials necessary for restoration of the area around the service assembly.

19-2.02 Connection to the Water Main

Connections to the water mains for service assemblies shall be as shown on the plans and as described for Water Main Taps elsewhere in these specifications.

19-2.03 Service Lines

Materials used for 1" and 1¼" service lines shall be polyethylene (PE) pipe with an inside-diameter based dimension ratio of 7, a pressure class of 200, made with PE 3408 material, and all conforming to AWWA C901. The inside diameter, minimum wall thickness, and maximum tolerance shall all conform to Table 3 of AWWA C901. Polyethylene pipe shall be supplied with plain ends only and in either straight lengths or in coils. Pipe ends shall be jointed using brass compression fittings as shown on the plans. Fusion fittings or heat molded flair fittings will not be allowed. Polyethylene pipe shall be marked at 5-foot intervals with the pipe nominal size, the material code design (PE 3408), the dimension ratio and diameter base (IDR 7), the AWWA pressure class (PC200), the AWWA standard designation (AWWA C901), the manufacturer's

name or trademark and production record, and the seal or mark of the testing agency that certified the suitability of the pipe material for potable-water products (for example, NSF).

Materials used for 2" service lines shall be Schedule 40 or 80 polyvinyl chloride [PVC] (schedule determined by the working pressure) and shall comply with the requirements for Water Mains described elsewhere in these specifications.

Service lines 3" in diameter shall not be allowed.

Materials for service lines 4" and larger shall be ductile iron and shall comply with the requirements for Water Mains described elsewhere in these specifications.

19-2.04 Service Shutoff Valves

Service shutoff valves located at the connection to the water main, if required, shall be of the size shown on the plans and shall comply with the requirements for Main Line Valves described elsewhere in these specifications.

19-2.05 Service Line Fittings

Fittings for 2" and smaller service lines shall be brass conforming to Section 34 Brass Pipe and Fittings. All valves and fittings shall be suitable for use in high-pressure service lines with a minimum 150 psi working pressure, as defined in AWWA C800 and shall withstand a maximum pressure of 300 psi without leaking. All valves and fittings shall be furnished with end configuration as shown on the plans. Affidavits of Compliance may be required from the manufacturer stating that the casting materials, minimum working pressure, and minimum burst pressures of the fittings comply with these specifications.

Fittings for 2" and smaller service lines shall be furnished with the end configurations as shown on the plans. All threaded ends shall be National Pipe Thread Standard (NPT). Compression joints or pack joints shall be furnished with stainless steel insert stiffeners when required by the fitting manufacturer. Fittings shall be as manufactured by the Ford Meter Box Co., or approved equal.

Fittings for service lines 4" and larger shall be ductile iron, conforming in all respects to Water Mains described elsewhere in these specifications.

19-2.06 Meter Valves

Meter valves are located in the meter box immediately before the meter. Meter valves size, type and end configurations shall be as shown on the plans and as specified herein.

Meter Valves 2" and smaller shall be of brass construction and shall be fitted with a coupling or flange of adequate size and configuration to connect to the meter. Meter valves shall be either straight or angle ball valves with end configurations as shown on the plans and conforming to fittings as described in this section. Ball valves shall be 1/4 turn, pull-port valves. All meter valves shall be furnished with locking wings. Meter valves shall conform to Section 34 Brass Pipe and Fittings and be as manufactured by the Ford Meter Box Co., or approved equal.

Meter valves 4" and larger shall comply with the requirements for Main Line Valves described elsewhere in these specifications.

19-2.07 Brass Pipe and Fittings

Brass pipe used for service assemblies, as shown on the plans, shall conform to Section 34 Brass Pipe and Fittings, standard weight. Pipe ends shall be finished with male iron pipe threads.

Brass fittings used for 2" and smaller service assemblies such as tees, elbows, nipples, bushings, shall be red brass conforming in all respects to Section 34 Brass Pipe and Fittings. They shall have ends finished with male or female iron pipe threads and shall have a pressure rating equal to or higher than the working pressure at the point of application. Brass fittings shall be as manufactured by Lee or approved equal.

19-2.08 Meter Boxes for 2" and Smaller Meters

Meter boxes shall be placed in the locations shown on the plans, or as directed by the District Engineer. The locations may include traffic or non-traffic. Traffic areas shall be those areas that are routinely, or occasionally, subjected to traffic loads including, but not limited to roadways, driveways, parking areas, and sidewalks with rolled curbs. The meter boxes shall comply with the following requirements for the respective locations:

19-2.08-A Non-Traffic Locations

Meter boxes, lids, extensions, slabs, and wooden block shall be as shown on the plans and as specified herein. The meter box, lid, and extensions shall be precast reinforced concrete, all by the same manufacturer. The slabs shall be precast and a minimum of 11/2" thick. Poured-in-place slabs shall not be accepted. The wooden blocks in contact with soil shall be pressure treated suitable for buried service. Wooden blocks used as spacers inside of box shall be construction grade Douglas Fir.

The lids shall have a cast iron reading lid with self-closing hinge, or, where shown on the plans, a concrete insert reading lid.

The box, lid and extensions shall be as manufactured by Christy Concrete Products, Inc., or approved equal.

19-2.08-B Traffic Locations

Meter boxes, lids and slabs for single 5/8" and 3/4" meter assemblies in traffic locations shall be Christy B1324 Box, a B1324-61GH lid, and a B30SL slab. Double 5/8" and 3/4" meter assemblies in traffic locations shall be split at the branch piece into two single boxes, as described above. A 6" thick by 8" wide concrete collar or pad shall be poured around the top of the box and under the pavement and shall conform to valve pads described for Main Line Valves elsewhere in these specifications.

Meter boxes, extensions, lids and slabs for meter assemblies larger than 3/4" and up to 2", and located in traffic areas shall be as shown on the plans and as specified herein. The box, extension, and slab shall be precast reinforced concrete. The box inside dimensions, including depth, shall be at least as large as those shown on the plans. The lid shall be of steel checker plate with an 8" diameter self-closing reading lid centered over the meter dial. The lid shall be segmented so that no segment weighs more than 80 pounds, or segments shall be hinged and spring assisted. The lid segments shall be held firmly in place with bolts or screws with recessed heads. The lid assembly shall be primed and painted with two coats of asphalt varnish or coal-tar enamel; black in color.

Both the box and lid assembly shall be reinforced sufficiently to withstand high volume of vehicular traffic of H20 loading. The Contractor shall submit for approval an Affidavit of Compliance from the manufacturer regarding the box and lid's ability to withstand the traffic loading conditions described herein. A 6" thick by 8" wide concrete collar or pad shall be placed around the top of the box and under the pavement, and shall conform to valve pads described for Main Line Valves elsewhere in these specifications and on the plans. The box, lid and extensions shall be as manufactured by Christy Concrete Products, Inc., or approved equal.

19-2.09 Meter Vaults for 3" and Larger Meters

Vaults for meters 3" and larger shall be of the type and size shown on the plans.

19-2.10 Concrete for Meter Box Pad

Concrete used for the meter box pad and shutoff meter box pad shall be 3,000 psi conforming in all respects to the requirements for Concrete Work.

19-2.11 Locating Wire and Connectors

Locating wire shall be bare No. 8-gauge, single strand soft drawn copper.

Connectors shall be brass split-bolt connectors or other type of mechanically tightened joint connector approved by the District Engineer. Wire nuts or twisted joints shall not be used.

19-2.12 Trench Restoration Materials

Materials used for trench restoration including pavement, chip seal, aggregate base, sand-cement slurry, and crushed rock shall be as designated for Water Mains elsewhere in these specifications.

19-3 Installation

19-3.01 General

Service assemblies shall be installed as shown on the plans and as designated in these specifications.

19-3.02 Storage and Handling

Service line materials and fittings shall be stored and handled in their original containers and shall be maintained free of dirt and foreign matter. They shall be stored on wooden pallets and protected from dirt and other contaminants. Service line materials shall be protected from direct sunlight while being stored. Materials for service assemblies shall not be strung out on the job more than two days prior to installation.

19-3.03 Excavation and Backfill

Excavation and backfill operations shall conform to all the requirements for Water Main Pipe Trench Excavation and Backfill. For service lines shown on the plans with a sand envelope, the sand shall conform to Class 1 material as designated for Water Main Backfill.

19-3.04 Service Line and Fitting Installation

In general, service lines shall be installed as Water Mains described elsewhere in these specifications, and in accordance with the requirements herein. The Plans or Special Conditions of the Contract may require service lines be installed by a bore-and-jack or similar method.

Polyethylene service lines between the water main and meter box shall be one continuous piece of pipe. Remnant pieces of service line material joined by couplings will not be allowed. Sharp bends in polyethylene service lines shall be avoided. Polyethylene service line(s) shall be slightly "snaked" in the trench to accommodate thermal expansion and contraction. Service line fittings with compression couplings shall be installed according to the manufacturer's recommendation. Compression fittings shall be supplied with stainless steel inserts, if required by the manufacturer.

Threaded brass fittings and nipples shall be installed in a workmanlike manner using teflon tape as a joint lubricant and sealant.

19-3.05 Corrosion Protection

Corrosion protection for the connection to the main shall conform to Corrosion Protection for Water Main Taps described elsewhere in these specifications.

The brass pipe and fittings, and brass compression fittings shall be primed and wrapped with tape after assembly is complete. The tape shall be made of coal tar and/or synthetic resin compounds and shall be laminated to an outer film of vinyl for added strength. The tape, with the vinyl cover, shall have a total minimum thickness of 45 mils. The brass pipe shall be cleaned of all loose scale and dirt, and all grease, oil and other foreign matter before applying the primer. The tape shall be spiral-wrapped with a ½" minimum overlap. The primer and tape shall both be supplied by the same manufacturer and applied in accordance with the manufacturer's recommendation. This corrosion protection tape shall be as manufactured by Protecto Wrap (Primer No. 1170 and Tape No. 200) or Polyguard (Primer No. 600 and Tape No. 610).

Service lines constructed with ductile iron pipe shall have all bolts, glands, setscrews and other metal fasteners protected from corrosion. These joints shall be wrapped in conformance with corrosion protection for Water Main Joints as designated elsewhere in these specifications. If the plans require the water main to which the service lines are attached to be polyethylene encasement per AWWA C105, then the ductile iron service lines shall be encased accordingly.

19-3.06 Locating Wire

A locating wire shall be installed with the service lateral and extended into the meter box, all as shown on the plans and as described for Water Mains, elsewhere in these specifications.

19-3.07 Meter Box Installation

Meter boxes placed outside of the traveled way and road shoulder areas shall be raised slightly above ground level and all surrounding drainage shall be directed away from the meter box.

19-3.08 Surface Restoration and Final Cleanup

After backfill and compaction is complete, the surface over the service assembly and all other

surfaces disturbed by this work shall be restored to an "good as or equal to" condition as it existed prior to start of construction, all conforming to Trench Restoration and Final Cleanup for Water Mains, as described elsewhere in these specifications.

19-4 Trench Restoration and Final Cleanup

Trench restoration and final cleanup shall comply in all respects to Water Mains, as described elsewhere in these specifications.

19-5 Measurement and Payment

19-5.01 Measurement

Work performed under this section shall be measured as the number of the different size and types (single or double) service assemblies that have been completely installed. Note: On the Bid Schedule, each double service assembly is counted as one unit; even though each assembly is capable of receiving two meters.

19-5.02 Payment

The Contract unit prices shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work necessary for the installation of Service Assemblies as shown on the plans or as designated in these specifications. A description of the work is included at the head of this section. Any work associated herewith, but not included in other bid items, shall be deemed as included in the work described in this section.