

SECTION 4 – MATERIALS

4-01 GENERAL

All materials and equipment installed in City of Compton’s water system shall meet all state and federal standards, as well as standards developed by nationally recognized organizations such as AWWA, ANSI and NSF. In order to protect human health, all materials, chemicals, lubricants, and products in contact with drinking water shall be tested and certified as meeting NSF/ANSI Standard 60 (Drinking Water Treatment Chemicals-Health Effects) and NSF/ANSI Standard 61 (Drinking Water System Components-Health Effects).

In addition, all materials coming in contact with potable water shall be lead-free per California Health & Safety Code Section 116875. All materials are required to be certified as lead-free by NSF or other ANSI accredited certifier per SB 1334.

4-01.01 Protection of Metal Surfaces

All buried metal surfaces on valves, flanges, bolts, nuts, tie rods, turn buckles, restraint devices, couplings, and other appurtenances in contact with the earth and backfill materials shall be coated with a minimum 30 mils of JS160H Mastic manufactured by Protecto Wrap Co., 30 mils of Bituminous Mastic 50-HT by Utility Coating Company, or approved equal. In addition to this coating, all metal surfaces as previously described, shall be encased in 8 mils polyethylene protective wrapping and tape wrapped to the pipe barrel in accordance with AWWA C-105 and Sections 4-02.03 and 5-03.04 of these Specifications.

4-02 DUCTILE IRON PIPE

Ductile iron pipe shall conform to the requirements of AWWA Standard C151. Unless otherwise specified, size 4 inch through 12 inch shall be Pressure Class 350. Pipes greater than 12 inch and up to 24 inch in diameter shall be Thickness Class 52. Pipes larger than 24 inches in diameter and all above ground pipes shall be Thickness Class 53. Special order pipe sizes, such as 10 inch and 14 inch, are not allowed unless otherwise authorized by the Water Utility Division.

4-02.01 Pipe Joints

Ductile iron pipe shall be furnished in 18 foot nominal laying lengths and shall be bell and spigot type having a push-on joint employing a single rubber gasket, made of EPDM, to effect the joint seal, in accordance with AWWA Standard C111 , as manufactured by “TYTON®” from U.S Pipe, “FASTITE®” from AMERICAN Pipe or approved equal.

Where restrained joints are indicated on the plans or on Standard Drawings, push-on joints shall be restrained in accordance with the requirements of Section 4-01.06 of these Specifications.

4-02.02 Lining and Coating

All ductile iron pipes and fittings shall be factory cement mortar lined with seal coat in accordance with AWWA Standard C104, "Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water", and coated with bituminous material as specified in AWWA C151. Mortar lining of pipe or fittings in the field is not permitted.

4-02.03 Polyethylene Protective Wrapping

All buried ductile iron and gray iron pipes and fittings shall be polyethylene wrapped. Polyethylene protective wrapping ("Polywrap") shall conform to the requirements of ANSI/AWWA Standard C105/A21.5, "Polyethylene Encasement for Ductile-Iron Pipe Systems", and be 8 mils thick (minimum) tubing of virgin polyethylene, as manufactured by Dupont Alathon, U.S.1. Petrothene resin, or approved equal.

Tubing shall be taped and secured with general purpose polyethylene tape, 2 inches wide and 10 mils thick as manufactured by Scotchrap No. 50, Plicoflex No. 340, Protecto Wrap No. 200, Polyken No. 900, or approved equal.

4-03 SPECIAL APPLICATIONS USING POLYVINYL CHLORIDE PIPE

At the sole discretion of the Water Utility Division, polyvinyl chloride (PVC) pipe material for distribution main may be used. PVC Pipe shall be Pressure Class 235 (DR 18), unless otherwise specified, conforming to the requirements of AWWA Standard C900 "Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 inch through 12 inch, for Water Transmission and Distribution" or C905 "Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 inch Through 48 inch" for pipe sizes larger than 12 inches in diameter.

4-03.01 Pipe Joints

PVC shall be furnished in 20 foot nominal laying lengths and have bell-end push-on joints employing a single elastomeric gasket in accordance with AWWA Standard C900 and C905.

4-03.02 Pipe Services and Appurtenances

All service saddles, sleeves, fittings, restraining devices, and other appurtenances used on PVC Pipe shall be approved by the Water Utility Division prior to use.

4-03.03 Restrained Joint PVC Pipe

Restrained joint non-metallic couplings for PVC pipe shall be CERTALOK™ C900 RJIB system manufactured by CertainTeed Corporation, Eagle LOC 900 manufactured by JM Pipe, or approved equal.

See Section 4-04 for additional thrust restraint system for PVC pipe.

4-03.04 Installation of Curvature

Where the pipeline is in non-restrained joint and to be installed in a curved alignment, the radius of curvature and specific alignment shall be shown on the plans and shall be accomplished by means of deflecting the pipeline at the joints with couplings. Couplings used in a curved alignment, where required deflection is between one and five degrees, shall be High Deflection Couplings, Class 305 manufactured by CertainTeed Corporation, or approved equal.

Contractor shall not exceed the manufacturer's recommendation for deflection for the couplings. Bending of the PVC is not allowed.

4-03.05 Markings

PVC Pipe shall be legible and permanently marked in ink with the following information.

- Manufacturer and Trade Name
- Nominal Size and DR Rating/Pressure Class
- Hydrostatic Proof Test Pressure
- [NSF-61]
- Manufacturing Date Code

4-03.06 Workmanship

The beveled end of any PVC pipe shall be cut off before the pipe is inserted into a mechanical joint fitting.

4-03.07 Fittings for PVC Main Line

Main line PVC pipe fittings shall be as called for on the construction plans. All fittings shall be ductile iron fittings per Section 4-07.

4-03.08 Tracer Wire and Warning Tape

Copper tracer wire and warning tape shall be installed per Section 5-03.02.

4-04 THRUST RESTRAINING MATERIALS

All mechanical thrust restraining devices shall be ductile iron except as noted for FIELD LOK gaskets. All devices shall withstand a working pressure of at least 250 psi with minimum safety factor of 2.

4-04.01 Mechanical Joints

Restraining devices for mechanical joint fittings shall be incorporated with the design of a follower gland and grip ring restraining mechanism that utilizes contact with entire circumference of pipe for restraint. The ring shall flex to accommodate deflection allowed in a mechanical joint after burial. If the mechanism is not available in the specified O.D., a similar wedge action restraint utilizing partial

contact with circumference of pipe shall be used. Glands shall be manufactured of ductile iron conforming to ASTM A536.

Approved Mechanical Joint Restraining System Manufactures For 4"-12"

Romac Industries, Inc.	GripRing™ (PVC or DIP)
Ford Meter Box Co., Inc.	Uni-Flange Block Buster™ 1300 (PVC or DIP)

Approved Mechanical Joint Restraining System Manufactures For 14"-48"

Romac Industries, Inc.	Romagrip™ (PVC or DIP)
EBAA IRON, Inc.	Megalug Series 1100(DIP), 2000 (PVC)
Smith-Blair	Cam-Lock™ (PVC or DIP)
Ford Meter Box Co., Inc.	Uni-Flange Block Buster™ 1300 (PVC or DIP)

4-04.02 Flanged Adapters

Flange adapters shall be fully restrained wedge activated type with a minimum working pressure of 250 psi and a safety factor of 2. Outside and inside surfaces of flange adapters shall be epoxy coated.

Flange Adapters shall be manufactured from ductile iron per ASTM A536 and shall have bolt circles and bolt holes to meet ANSI B16.1 – Class 125 or Class 250 if required and shown on the plans.

Approved Flange Adapter Manufacturers

EBAA IRON, Inc.	Megaflange™ Series 2100(PVC or DIP)
Romac Industries, Inc.	Field Flange™ (DIP)
Ford Meter Box Co., Inc.	Uni-Flange 900 - Adapter Flange (PVC) Uni-Flange 400 - Adapter Flange (DIP)
Smith-Blair	Flange-Lock™ (PVC or DIP)

4-04.03 Push-On Pipe Joints

Where restrained joints are indicated on the plans, push-on TYTON® joints shall be restrained with "Field-Lok" gaskets as manufactured by U.S Pipe, and FASTITE® joints shall be restrained with "Fast-Grip" gaskets from AMERICAN Pipe or approved equal.

Restrained joint pipe is an acceptable option for restraint of push-on joint pipe. Restrained push-on joint pipe and fittings shall be capable of being deflected after assembly.

Approved Restrained Pipe Manufacturers

U.S Pipe	"TR-Flex"
American Pipe	"Flex-Ring"
Pacific States Cast Iron Pipe Co.	Thrust-Lock™

4-04.04 Concrete

Concrete thrust blocks shall be Class 520-C-2500 concrete. If thrust block is to be disturbed or backfill is to be placed prior to developing its required strength, additional thrust restraining methods approved by the Engineer shall be installed.

Concrete chemical accelerating admixtures, such as calcium chloride, are not allowed unless approved by the Engineer.

4-05 MAIN LINE COUPLINGS

Sleeve-type couplings shall provide a flexible, watertight connection between two plain ends of pipe as shown on the construction plans or as directed by Engineer. For ductile iron and gray iron pipe, all couplings shall be ductile iron solid sleeve type conforming to AWWA C110, with mechanical joint ends and long body no less than 12 inches.

For steel, all couplings shall be standard steel couplings, with body no less than seven inches long. Bolts for exposed steel couplings shall be hot-dip galvanized. Bolts for buried steel couplings shall be Type 316 stainless steel. The Contractor shall strictly follow the torque limitations and shall use N-5000 Loctite® anti-seize/rust preventer lubricant manufactured by the Henkel Company, or approved equal. All sleeve type steel couplings shall be fusion bonded epoxy lined and coated with Scotchkote 6233, as manufactured by 3M/Corrosion Protection Products, or approved equal.

Buried metal surfaces shall receive additional protective coating and wrapping after they are assembled as per Section 4-01.01.

Approved Sleeve-Type Couplings for Ductile Iron, Cast Iron and PVC Pipe

Clow®	MJ Solid Long Sleeves
Tyler Corporation	5-144L Long Solid Sleeves
Romac Industries, Inc.	RFCA or PVS-RFCA

Approved Flexible Couplings for Steel Pipe

Smith Blair, Inc.	411 Steel Couplings
Smith Blair, Inc.	Quantum® Coupling Wide-Range
Romac Industries, Inc.	Model XR501

Approved Flexible Couplings for Transition to Belgian Cast Iron Pipe

Smith Blair, Inc.	OMNI 441 Ductile Iron Couplings
Smith Blair, Inc.	Quantum® Coupling Wide-Range
Romac Industries, Inc.	Macro HP

4-06 SLEEVES AND CLAMPS

4-06.01 Tapping Sleeves

Tapping sleeves shall have a stainless steel body with removable bolts. The outlet, body, flange, bolts and nuts shall be 18-8 type 304 stainless steel. All welds shall be fully passivated to restore stainless characteristics. Flange shall conform to AWWA Standard C207, "Steel Pipe Flanges for Waterworks Service-Sizes 4 Inch through 144 Inch", Class D ANSI 150 lb. with drilling recessed to accept standard tapping valves per MSS-SP 60. Bolt holes shall straddle pipe centerline. Shell gasket shall seal the full circumference of the pipe.

Approved Stainless Steel Tapping Sleeve Manufactures

Ford Meter Box Company, Inc.	FTSS
JCM	Model 432

Power Seal
Romac Industries, Inc.
Mueller

Model 3490
SST III
Model H304SS

4-06.02 Repair Clamps

Repair clamps shall have a full circle (one-section) band with removable drop-in bolts. The band shall be 18-8 type 304 stainless steel. Bolts, washers and nuts shall be high strength, low alloy steel per ASTM A242 and AWWA C111. Clamp shall have a lap type EPDM gasket with molded tapered ends to provide equalized sealing at the lap joint on any pipe within the clamps' range. The clamps shall have a built-in outside diameter (O.D.) range that fits several pipe-outside diameters within the clamp's nominal pipe size range.

Approved Stainless Steel Repair Clamp Manufactures

Ford Meter Box Company, Inc.	F1
Romac Industries, Inc.	CL1
Smith Blair, Inc.	226

4-07 MAIN LINE PIPE FITTINGS

Main line pipe fittings shall be supplied in accordance with AWWA Standard C110, "Ductile-Iron and Gray-Iron Fittings, 3 inch through 48 inch for Water and Other Liquids". Short body type fittings conforming to AWWA Standard C153 "Ductile-Iron Compact Fittings 3 inch through 24 inch for Water Service" may be used. All fittings shall have mechanical joints unless otherwise specified. All fittings shall be made of ductile iron. Fittings up to 24 inch size shall be 350 psi pressure ratings and over 24 inch size shall be 150 psi pressure rating. Fittings shall be cement mortar lined in accordance with AWWA Standard C104, "Cement Mortar Lining for Ductile – Iron Pipe and Fittings for Water." Fittings shall be coated with a bituminous material as specified in AWWA Standard C151.

4-07.01 Mechanical Joints

Mechanical Joints shall conform to the requirements of AWWA Standard C111, "Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings."

4-07.02 Flanged Joints

Flanged fittings shall conform to the requirements of AWWA C110 or C153. Flanges shall be drilled to ANSI B16.1, 125lb. standard bolt template. The 250 lb. Flanges, when required, shall be drilled to ANSI B16.1, 250 lb. standard bolt template.

4-07.03 Gaskets

Gaskets for flanged joints shall be made of EPDM rubber, either ring or full-faced, and 1/8 inch thick, bolt holes pre-punched, conforming to the requirements of AWWA C111 and ANSI B16.32. Whenever blind flanges are shown, the gasket shall consist of 1/8 inch thick synthetic rubber that shall cover the entire inside surface of the blind flange and shall be cemented to the surface of the blind flange.

4-07.04 Bolts and Nuts for Mechanical Joints and Flanged Fittings

Tee-head bolts and hexagonal nuts for all mechanical joints shall be high strength, low alloy steel, meeting the current provisions of ANSI/AWWA 0111/A21.11 Standard "Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings," and must be Cor-Ten as manufactured by NSS Industries, or approved equal.

Hexagonal bolts, nuts and washers for flanged fittings shall be zinc plated, high strength, low-carbon steel conforming to the chemical and mechanical requirements of ASTM A307, Standard Specifications for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength, Grade A.

Stainless steel nuts and bolts are required for above ground installations, steel pipe installations and stainless steel tapping sleeves. For all stainless steel nuts and bolts, the Contractor shall strictly follow the torque limitations and shall use N-500 Loctite® anti-seize/rust preventer lubricant manufactured by Henkel Company or approved equal.

All buried nuts and bolts shall be coated after assembly as per Section 4-00.01.

4-08 MAIN LINE VALVES

For water mains, resilient seated gate valves shall be used for 4 to 12 inches and butterfly valves for 14 inches and larger lines, unless shown differently on the plans or directed by the Engineer. All ferrous components of valves shall be ductile iron and coated with fusion bonded epoxy.

All valves shall open by turning the wrench nut left (counter-clockwise).

Prior to factory valve assembly, all internal and external ferrous metal surfaces shall be coated with a fusion bonded epoxy with a minimum dry film thickness of 10 mils. Coating shall conform to AWWA Standard C550, "Protective Epoxy Interior Coating for Valves."

4-08.01 General

Valves should be ductile iron body, fusion bonded epoxy lines, non-rising stem butterfly or fully encapsulated resilient wedge disk type gate valve and shall not have more than two internal moving parts. All valves shall open by turning the wrench nut counter-clockwise. Operating nut for butterfly valves shall be placed at the north or east side of the water line.

When required, above ground installations shall be resilient seat/wedge disk type valves with outside screw and yoke.

All bronze parts shall contain no more than 7% zinc, nor more than 2% aluminum. Stems shall be low zinc bronze, and equipped with a 2 inch operating nut conforming to AWWA C515. The valve manufacturer shall employ a positive physical means of indicating the specified stem material to insure ready recognition during inspection. The bolts and nuts on the bonnet shall be stainless steel type 304 or 316 with an anti-seize lubricant.

The ductile iron interior and exterior of all valves shall be protected with 10 mils (nominal) fusion bonded epoxy. Coating shall conform to AWWA Standard C213 and C550 and shall be certified to NSF 61. Field repair of epoxy lining is not permitted.

For above ground or vault installation, exterior coating to valves shall be as per Section 5-10.

Resilient wedge type gate valves with a flanged end may be used as “tapping valves.”

All valves shall be provided with an epoxy coat stem extension if depth of valve nut exceeds five feet. All valve extensions shall be centered in the valve well by use of a guide and shall be operated freely without binding after installation.

4-08.02 Gate Valves

Gate valves twelve inch and below shall conform to the requirements of AWWA Standard C509 Resilient-Seated Gate Valves and shall be “full wall ductile iron.”

All gate valves shall be ductile-iron body equipped with double O-ring stem seals, EPDM O-rings, and stainless steel bolts.

Approved Gate Valve Manufactures

American AVK	Model 45
US Pipe	Model # A-USP2-E381
Mueller	A-2362

4-08.03 Butterfly Valves

Butterfly valves shall conform to the requirements of AWWA Standard C504. Valves shall have a minimum working differential pressure across the valve disc of 150 psi for class 150B valves and 250 psi for class 250B valves. Valves shall be flanged short-body or restrained mechanical joint as indicated per the Construction Drawings. Flanges for both Valve Class 150B and 250B shall be drilled per ANSI B16.1, 125-pound standard bolt pattern. Valves shall be designed for buried installation.

<u>Component</u>	<u>Material</u>	<u>Specifications</u>
Body	Ductile Iron	ASTM A-536, Grade 65-45-12
Valve Shaft	Stainless Steel	Type 304 and Type 316
Exposed body, cap, screws, bolts and nuts including squeeze-pins	Stainless Steel	ASTM A-276, Type 316
Disc	Ductile Iron	ASTM A-536, Grade 65-45-12
Valve Seat	EPDM Rubber	ASTM D-412
O-Rings	Synthetic Rubber	ASTM D-2000

Valve seat material shall be peroxide cured EPDM rubber seat and shall be fastened integrally with the valve body. The valve disc shall be furnished with a stainless steel seating edge to mate with the rubber seat in the valve body. Valves with the seat located on the disc shall not be accepted.

The ductile iron interior and exterior shall be factory coated with NSF 61 approved 16 mils DFT high solids 2 part epoxy of no less than 65% conforming to AWWA standard C550, as manufactured by Amerlock® 400, Tnemec 141, or approved equal.

Valve operators shall be the manual type. Valve actuator shall be supplied and installed on the valve by the valve manufacturer. Gear actuators shall be for buried service applications and shall come furnished with a standard 2” AWWA operating nut. The operators shall be of travelling nut type with adjustable stops for valves smaller than 24 inches in size. The operator for valves 24 inches and larger shall be worm gear type.

Approved Butterfly Valve Manufactures

Mueller	B-3211, Lineseal XP2
Pratt	Groundhog, HP 250
DeZurik	BAW

4-08.04 End Connections and Gasket Materials

Gaskets shall conform to the requirements of Section 4-07.03 of these Specifications.

Valves shall have mechanical joints or flanged ends, or a combination of both. Unless otherwise shown on plans, all buried gate valves installed at fittings shall be flanged by mechanical joints, with the flange abutting the fitting.

4-08.05 Combination Air Release Valves

Unless otherwise specified, combination air release valves shall be of a single housing that combines the operating features of both an air/vacuum and an air release valve. They shall permit automatic escape of large quantities of air from pipelines when it is being filled, permit large quantities of air to enter pipeline when it is being emptied, and allow accumulating air to escape while pipeline is in operation under pressure. Combination air release valves shall be manufactured to meet or exceed the requirements of AWWA Standard C512, “Air-release, Air/Vacuum, and Combination Air valves for Waterworks Service.” Bodies and covers shall be of gray cast iron or ductile iron and shall have threaded connections. The float and all other trim shall be of stainless steel.

Prior to factory valve assembly, all internal and external ferrous metal surfaces shall be coated with a fusion bonded epoxy with a minimum dry film thickness of 10 mils. Coating shall conform to AWWA C550 and shall be ANSI/NSF Standard 61 certified. Field repair of epoxy lining is not permitted.

There shall be a downward facing screen vent on the valve outlet that meets OSHA requirements.

Approved Air Release Valve Assembly Manufacturers

	<u>1”</u>	<u>2”</u>
Crispin	UL10	UL20
Val-Matic	201C.2	202C.2

4-08.06 Valve Can Assembly

Valve can assembly materials and approved manufactures/models are shown on City of Compton Standard Drawing 650.

4-09 FIRE HYDRANT ASSEMBLY

Fire hydrant assemblies shall be of the wet-barrel epoxy coated, ductile iron body type conforming to AWWA C503, "Wet-Barrel Fire Hydrants." The Standard for assembly consists of a one-piece body section connected to a break-off check valve and a one-piece bury section with a nominal ID six inch bolted flange joint. The flange shall have a bolt pattern of six equally spaced bolt holes of 3/4 inch diameter. See City of Compton Standard Drawing 610 for break-off check valve requirements.

4-09.01 Materials

The hydrant body shall be ductile iron conforming to AWWA C110. All ferrous surfaces inside the body shall be fusion-bonded epoxy coated conforming to the requirements of AWWA C550. The body of the hydrant shall be painted as specified in Section 5-10 of these Specifications.

The plan shall designate either a type 1 or type 2 hydrant. A type 1 hydrant shall have one 2 1/2" hose outlet and one 4" pumper outlet. A type 2 hydrant shall have two 2 1/2" hose outlets and one 4" pumper outlet. The outlet threads shall conform to ANSI – B26 "National Standard Fire-Hose Coupling Screw Threads." Hydrants shall be equipped with cast or ductile iron outlet nozzle caps fitted with appropriate neoprene rubber gaskets.

The valve-operating stem and outlet-nozzle cap nuts shall be pentagonal, with 1 1/8" from point to flat, and the length of the pentagon shall be no less than one inch. The hydrant cap is removed and the valve opened by turning left (counter-clockwise). The valve outlet-nozzle cap shall be cast iron or ductile iron.

Approved Fire Hydrant Manufacturers

	<u>Type 1</u>	<u>Type 2</u>
Clow	850D	860D
AVK	2470	2490
Jones	4040D	4060D

Approved Break off Check Valve Manufacturers

Clow	400A
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4-09.02 Hydrant Bury and Extensions (Spools)

Fire hydrant buries shall be cast or ductile iron, asphalt coated and cement lined. The base of the bury shall have a mechanical joint conforming to AWWA C110.

When shown on the plans or approved by the Engineer an extension (spool) may be inserted between the hydrant body and bury. The spool shall be a non-break away and shall be cast or ductile iron, asphalt coated and cement lined.

4-09.03 Hydrant Protection

Due to location, terrain, available drainage area, and/or system pressure, the plans or the Engineer may require guard posts for hydrant protection. See Standard Drawing 615 for guard post requirements.

4-09.04 Hydrant Reflective Markers

Markers shall be blue, dual-face and reflective, conforming with the State of California Department of Transportation S.T.O. Specification, Section 85-1.05. Markers shall be Stimsonite 88AB or approved equal.

Epoxy to permanently mount the marker shall be two parts, standard set, as sold by Western Highway Products, 10650 Fern Avenue, Stanton, California 90680, or approved equal.

4-10 SERVICE LATERAL INSTALLATION

All valves and fittings for use in one inch and two inches service laterals from the main to the meter shall conform to the requirements of AWWA Standard C800, "Underground Service Line Valves and Fittings," and meet the California Health and Safety Code Section 116875. Materials in contact with potable water shall be lead free per SB1334. All corporation stops and angle meter valves used for copper installations shall have compression connection for copper tubing. Approved manufactures are Jones, Ford, McDonald, and Mueller, as shown on City of Compton Standard Drawings 601 and 602.

4-10.01 Corporation Stops

All corporation stops shall have inlet iron pipe (IP) threads as specified by AWWA C800 with outlet being a compression connection for copper tubing.

4-10.02 Angle Meter Valves

All angle meter valves shall be full port "ball" type, have a locking wing on the key operator, and with full 360 degrees rotation of tee head (less stop). All valves for $\frac{5}{8}$ x $\frac{3}{4}$ inch and 1 inch meters shall have a compression inlet and a meter swivel nut outlet. All 2 inch valves shall have a compression connection inlet for two 2 inch copper tubing and a meter flange outlet slotted to accommodate 1½ inch and 2 inch meters. Slots should not extend to the outside edge of flange – open slots are not accepted.

4-10.03 Copper Tubing

Copper tubing for service laterals shall be one inch or two inches seamless, annealed, Type “K” meeting the requirements of ASTM B-88, “Specifications for Seamless Copper Water Tube.”

Copper tubing shall be furnished in coils or straight lengths as follows:

<u>Size</u>	<u>Form</u>	<u>Length</u>
1” & 2”	Coils	60’ to 100’
2”	Straight Lengths (rigid)	20’

Coils shall be wound in a single layer flat with a minimum 24 inch inside diameter.

4-10.04 Red Brass Pipe

Brass pipe shall conform to the requirements of the “Specifications for Seamless Red Brass Pipe, Standard Sizes” ASTM Specification B-43, and referenced in the appendix to AWWA Standard C800.

4-10.05 Service Saddles

For 1 inch and 2 inch service taps, service saddles are required for all types of pipe. Service saddle outlets shall be tapped as specified by AWWA C800. Outlet threads for 1 inch and 2 inch service saddles shall be iron pipe threads (IP). All service saddles for cast or ductile iron pipe shall be bronze conforming to ASTM B-62 with double strap. All service saddles for PVC pipe, AWWA Standard C900, shall be bronze conforming to ASTM B-62, incorporating stainless steel bands in place of the standard bronze straps. Approved manufactures and catalog numbers are shown on City of Compton Standard Drawings 601 and 602.

Service tapping to concrete cylinder pipes shall only be made under special approval by the Water Utility Division.

4-10.06 Meter Boxes and Vaults

Meter boxes and vaults shall be constructed of straight wall polymer concrete. Where required, meter boxes shall have traffic loaded rating covers. All Covers that are exposed to foot traffic have a slip resistant surface that meet the American with Disabilities Act slip resistance requirements. Contractor is responsible for selecting a meter box or vault that is sized appropriately to accommodate all required water materials specified in Standard Drawings. Contractor is required to submit said meter box or vault to the City for review and approval prior to installation.

Approved Manufacturer

Armorcast Products Company

4-11 LARGE SERVICE INSTALLATION

4-11.01 Meter Assembly

All large service installations, except fire lines, shall include a meter, backflow device, and provisions for a temporary bypass line and test tee. For three and four inch service laterals, meter size, type and manufacturer, bypass, test tee, and backflow device are shown on City of Compton Standard Drawings 603. For six inch and above service laterals, meter assemblies shall be individually designed and approved by the Water Utility Division.

4-11.02 Tapping Tees

See Section 4-06.01 of these Specifications for tapping requirements.

4-11.03 Backflow Prevention Assemblies and Fire Lines

See Section 3 of these Specifications for backflow prevention assembly and fire line requirements.

4-11.04 Guard Posts

Where required by the plans or by the Engineer if field conditions so dictate, guard posts shall be installed. The number, size and specific location of such posts will be determined by the Engineer if not shown on the plans. Guard posts shall be per City of Compton Standard Drawing 615.

4-12 METERS

4-12.01 Positive Displacement Types

Meters 2 inch or less in size are classified as small meters and shall conform to AWWA C700 Standard Specifications for "Cold Water Meters – Displacement Type, Bronze Main Case." All meters shall consist of a bronze main case with serial numbers stamped on the main case. All meters shall be read in cubic feet.

4-12.02 Turbine Types

The use of turbine meters requires prior approval by the Water Utility Division and will be authorized only on a case by case basis. When authorized, all turbine meter installations shall include a strainer and shall conform to AWWA C701. All meters shall be read in cubic feet.

4-12.03 Compound Types

The use of compound meters requires prior approval by the Water Utility Division and will be authorized only on a case by case basis. When authorized, all compound meter installations shall include a strainer and shall conform to AWWA C702. All meters shall be read in cubic feet.

4-13 DEVIATION FROM SPECIFICATIONS

Any deviation from these specifications shall be submitted in writing by the Contractor to the Engineer. Said submittals shall be delivered to the Engineer to allow sufficient time for review. The Engineer's determination will be provided in writing and must be available to the Contractor 2 working days prior to construction schedule.

4-14 MATERIAL CERTIFICATIONS

All water system materials furnished for installation by Contractor shall be provided with clear manufacturer's markings and labeling indicating that the material furnished meets the standards and requirements of these Specifications. All materials shall be new, not previously used, and of current manufacture. In addition, the engineer may request that a written manufacturer's statement be provided indicating that a material conforms to the standards and requirements of these Specifications.

All materials shall be subject to inspection. No materials shall be installed until accepted by the Engineer.

A copy of invoices of all materials furnished by the Contractor shall be furnished to the Engineer as proof of compliance with these specifications upon request.

All like materials shall be of one manufacture for any particular project.