

PART 1 GENERAL

1.1 SCOPE:

- A. This Section describes allowable pipe and fittings materials for use in construction of water, wastewater and storm water projects.

1.2 MANUFACTURE:

- A. All material shall be new and of U.S. manufacture including valves, pipe, fittings and etc. unless approved prior to installation, through the submittal process.

PART 2 PRODUCTS

2.1 DUCTILE IRON PIPE & FITTINGS:

- A. CLASS - Pipe and fittings shall be Class 52 for all ductile iron pipe & fittings.
- B. LINING & COATING - Ductile iron pipe shall be cement-mortar lined and seal-coated and shall conform with ASTM C536, AWWA C151, AWWA C104, and AWWA C111, as manufactured by Pacific States Pipe (503.690.4948), US Pipe (503.241.8347) or approved equal.
- C. JOINTS - Ductile iron pipe shall be constructed with Tyton joints, or equal, for pipe runs up to but excluding fittings where mechanical joints shall be used as specified. Joint lubricant, when required, shall be in accordance with the pipe or joint manufacturer's recommendations and shall be water soluble and non-toxic. Lubricant as produced by Black Swan Manufacturing Co. (312.227.3700) or equal will be accepted. Rubber gasket joints shall be standard SBR gaskets in conformance with AWWA C111/A21.11.
- D. FITTINGS AND APPURTENANCES -

1. SERVICE LINES

Each individual water service connection shall be equipped with the appropriately sized pipe and brass stops as shown on Standard Details.

All water service pipelines shall be seamless copper (Type K) tubing conforming to ASTM B88 for potable water transmission. No service pipe shall be smaller than 1-inch in diameter.

2. ANGLE METER VALVE STOPS

Angle meter valves shall be 1-inch minimum, lock wing style, bronze body conforming to AWWA C800. Inlets shall be compression fitting and accept copper tubing and outlets shall be meter swivel nut. Angle meter valves shall be as manufactured by Ford Co., model No. KV43-444W, or equal.

3. CORPORATION STOPS

Full way bore corporation stops shall be bronze body, 1-inch minimum size conforming to AWWA C 800 and have Mueller CC thread male inlet and compression outlet sized for seamless copper (Type K) tubing. Corporation stop(s) shall be as manufactured by Ford Co., model No.F-1000-4, or equal. Direct corporation taps can be made on the following ductile iron pipe sizes. All other sizes shall be saddle tapped. Refer to Table B-2.

TABLE B-2			
<u>DIA.</u>	<u>TYPE</u>	<u>CLASS</u>	<u>TAPPING SERVICE DIMENSIONS</u>
4"	D.I.	52	Saddle
6" & Larger	D.I.	52	Direct Tap

4. SADDLES

Saddles shall be all brass (body, straps, nuts and bolts) be of the double strap type with iron pipe threads and be of Ford or Romac manufacturer or equal. Straps may be bronze if approved prior to installation. Saddle shall be equipped with a gasket of Buna-N rubber conforming to ASTM D2000.

5. NUTS, BOLTS, AND WASHERS

Nuts, bolts and washers shall be ductile iron or zinc coated steel. Zinc coating shall be by the hot-dip process and shall conform to ASTM B6.

E. DUCTILE IRON RESTRAINED JOINT PIPE -

1. When allowed, mechanical joint restraint shall consist of individually actuated wedges that increase their resistance to pullout as pressure or external forces increase. The device shall be capable of full mechanical joint deflection during assembly and the flexibility of the joint shall be maintained after burial.
2. The joint restraint ring and its wedging components shall be made of grade 60-42-10 ductile iron conforming to ASTM A536. Wedges shall be ductile iron heat treated to a minimum hardness of 370-BHN.
3. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell conforming to ANSI/AWWA C111/A21.11 nuts shall be used to insure proper actuation of the restraining wedges.
4. Restrained joint shall have a rated working pressure of 350-psi in sizes less than and up to 16-inch dia. and 250-psi for sizes 18-inch dia. and above. Device shall be UL and/or Factory Mutual (FM) approved.

5. Restrained joint shall be as manufactured by MEGALUG™ Series 1100, or equal.

2.2 POLY-VINYL CHLORIDE (PVC) PIPE AND FITTINGS:

- A. Pipe materials under this item shall be PVC and in conformance with ASTM D3034 (for less than 18-inch diameter) and/or ASTM F679 (for 18-inch and greater diameter).
- B. Tees and wyes for service laterals shall be furnished by the pipe manufacturer and shall be of the same size and class as the sewer pipe runs in which they are installed. Branches shall be 4-inch diameter minimum for service laterals. All branches shall be provided with plugs or caps on the branch.
- C. Gaskets shall conform to ASTM D1969.

2.3 PVC PROFILE PIPE AND FITTINGS:

- A. Profile pipe shall be ASTM F794 and have a minimum wall stiffness of 46-psi and conform to wall thickness T-1 in the Uni-Bell Handbook.
- B. Tees and wyes for service laterals shall be furnished by the pipe manufacturer and shall be of the same size and class as the sewer pipe runs in which they are installed.

2.4 HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS:

- A. HDPE pipe shall meet the applicable requirements of ASTM D3550.
- B. The minimum SDR shall be 17.
- C. Each length of pipe and fitting shall be marked by the manufacturer with trade name, nominal size, the ASTM Specifications number, and the type and grade.

2.5 COUREGATED POLYETHYLENE (PE) PIPE AND FITTINGS:

- A. Corrugated PE pipe and fittings shall conform to AASHTO M294, Type S or D.

2.6 NONREINFORCED CONCRETE PIPE AND FITTINGS:

- A. Nonreinforced concrete pipe shall conform to ASTM C14, latest edition, of the class shown on the Plans. Pipe shall be furnished with a rubber gasket type joint, similar to the Brant joint or approved equal. The rubber gaskets shall be manufactured in conformance with ASTM C443.
- B. Tees and wyes for service laterals shall be furnished by the pipe manufacturer and shall be of the same size and class as the sewer pipe runs in which they are installed

2.7 REINFORCED CONCRETE PIPE AND FITTINGS:

- A. Reinforced concrete nonpressure pipe shall conform to the requirements of ASTM C76 or C655. The pipe shall meet the design requirements of wall B.
- B. Reinforced concrete low-head pressure pipe shall conform to the requirements of ASTM C361.
- C. Tees and wyes for service laterals shall be furnished by the pipe manufacturer and shall be of the same size and class as the sewer pipe runs in which they are installed.
- D. Gaskets shall conform to the requirements of ASTM C443.

2.8 GALVANIZED CORRUGATED STEEL PIPE AND FITTINGS:

- A. Galvanized corrugated steel pipe and fittings shall conform to the requirements of AASHTO M36 or M167.
- B. The surfaces of corrugated steel pipe shall be completely coated with bituminous material conforming to AASHTO M190, with a minimum thickness of 0.05-inch at the crest of the corrugations.

2.9 CORRUGATED ALUMINUM ALLOY PIPE AND FITTINGS:

- A. Corrugated aluminum alloy pipe and fittings shall conform to the requirements of AASHTO M196, M197, M211, and M219.

PART 3 EXECUTION**3.1 PIPELINE CONSTRUCTION:**

- A. Pipeline construction shall be as specified for the end use and as outlined in Sections 5000 "Waterline Installation", 6200 "Sanitary Sewer Installation" and 7000 "Storm Sewer Installation".

3.2 MEASUREMENT AND PAYMENT:

- A. Measurement for pipe will be to the nearest 0.1 LF as field measured for the type, class, diameter and use of pipe installed and particularly as set forth in the specification for type of installation (i.e. water, sanitary and/or storm).

PART 4 TESTING**4.1 GENERAL:**

- A. Testing of pipe shall be accomplished on per lot basis as specified in the referenced ASTM for pipe material specified and certification of results shall be submitted to the Engineer when requested.
- B. Testing of constructed pipelines shall be as specified in the technical specification(s) for the end

use.

END OF SECTION