OKEECHOBEE UTILITY AUTHORITY

SWSA Master Force Main Product Specifications

1. PVC PRESSURE PIPE
   A. PVC Pressure Piping

      1. Unless otherwise noted, PVC pressure pipe for nominal diameters of 4 inches to 12 inches shall conform to the requirements of AWWA C900, DR 18. Pipe shall have a gasketed integral bell end. Pipe shall be designed for maximum working pressure of not less than 150 psi. PVC pipe shall have ductile iron pipe OD. The PVC pipe shall be green for wastewater use and shall have markings such as “WASTEWATER” or “SANITARY FORCE MAIN” longitudinally along the sides.

   B. Bell and Spigot

      1. Pipe joints shall be made with integral bell and spigot pipe ends. The bell shall consist of an integral thickened wall section designed to be at least as strong as the pipe wall. The bell shall be supplied with a factory glued rubber ring gasket that conforms to the manufacturer's standard dimensions and tolerances. The gasket shall meet the requirements of ASTM F477. PVC joints shall be "Ring-Tite" as manufactured by J-M Manufacturing Company, Inc. or an equal as approved by the Owner. Nontoxic gasket lubricant shall be as specified by the pipe manufacturer.

2. PVC PIPING RESTRAINTS

   The following pipe joints and fittings restraint methods can be used to prevent pipe joints and fittings from separating under pressure.

      1. C-900 PVC pipe bell and spigot joints (4-inch- through 12-inch- diameter pipe) shall be restrained with the EBAA Iron MEGALUG® Series 1600 Restrainer or an equal approved BY THE Owner. The Series 1600 restrainers shall provide a minimum of 150 psi restraint to DR 18 (Class 150) pipe with a 3 to 1 safety factor. The restraining device and tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion-resistant, high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

      2. Mechanical joint fittings used with PVC pipe (4-inch- through 12-inch-diameter DR 18 pipe) shall be restrained with the EBAAIron MEGALUG® Series 2000 PV Restrainer or an equal approved by the Owner. The Series 2000 PV restrainers shall provide a minimum of 150 psi restraint with a 2 to 1 safety factor. The restraining device and tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion- resistant,

high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

3. All parts of the joint restraint systems shall be coated with coal tar epoxy, Mega-Bond coating system by EBAA Iron, Inc. or Owner-approved equal.

3. DUCTILE IRON FITTINGS

A. General: Ductile iron pipe fittings shall be the compact type meeting the requirements of AWWA C110/A21.10 and AWWA C153/A21.53 where applicable. Ductile iron fittings shall be epoxy lined. Fittings shall be manufactured in accordance with AWWA C110/A21.10. At a minimum, fittings shall have the same pressure rating as the connecting pipe.

B. Ceramic Epoxy Lined Fittings:

1. General: The lining shall be an amine-cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. The lining material shall be Protecto 401 Ceramic Epoxy as manufactured by Induron Protective Coatings, Inc. The lining shall be applied by a competent pipe lining specialty firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

2. Application: The lining applicator shall apply lining according to the requirements of the Protecto 401 Specification and application methods and procedures.

C. Acceptable ductile iron pipe manufacturers include US Pipe, American Ductile Pipe, Griffin Pipe, or approved equal.

4. HDPE PIPING

A. General

1. All HDPE shall be DriscoPlex PE 4710 HDPE or Owner approved equal.

2. All HDPE pipe 4 inches in diameter or greater shall have a Ductile Iron Pipe outside diameter.

3. All HDPE piping system components shall be the products of one manufacturer.

4. Pipe and fittings shall be manufactured by an ISO 9001-certified manufacturer.

5. HDPE Pipe exterior shall one or more longitudinal stripe(s) which are green in color. There may also be wording, such as “WASTEWATER” or “SANITARY FORCE MAIN” including in the product labeling.

6. HDPE pipe 4 inches in diameter and larger shall conform to material standard ASTM D3350 345434 E cell classification rated as PE 3408 by the Plastics Pipe Institute. Minimum pressure rating shall be 200 psi SDR 11 (Standard Dimension Ratio) for pipe sizes greater than 4 inches in diameter.

7. The polyethylene compound shall be suitably protected against degradation by ultraviolet light.

8. The maximum allowable hoop stress shall be 800 psi at 73.4ºF.

9. The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the requirements of the resin manufacturer to manufacture pipe from the resin used.

5. VALVES

A. General Description

1. All valves shall meet or exceed all applicable provisions of the latest revision of AWWA C512. All valves for drinking water services shall comply with NSF 61. Design pressure is 150 psig. Valves shall be operable for water temperatures of above freezing to 125°F.

2. All valves shall consist of a float or a float assembly. Valves shall be identified properly in plates attached permanently on the valve body. The body and cover shall be cast-iron ASTM A126, Class B, or ASTM A48/A48M, Class 35. Valves 3 inches and smaller shall have threaded ends. Valves 4 inches and larger shall have flanged ends. Threaded ends shall comply with ASME B1.20.1. Flanges shall comply with ASME B16.1, Class 125. All flanges shall be flat faced.

3. The float shall be Type 304 or 316 Stainless-Steel. For valves with inlet sizes less than 4 inches, the float shall be able to withstand a collapse pressure of 1,000 psig. For inlet sizes 4 inches and larger, the float shall be capable of withstanding collapse pressures of 750 psig. Trim shall be Type 304 or 316 Stainless-Steel. The valve seat shall be of EPDM or other rubber materials applicable to wastewater and sludge. The valve seat shall be easily removed and replaced in the field.

4. Drain/test ports on all valves with inlet size 1 inch or larger shall have two 1/2-inch NPT minimum plugged ports, one near the bottom of the valve body and the other near the top of the valve. The plug shall be of bronze, ASTM B584, Alloy C83600.

B. Air Valves for Sewage Services, Air Release:

1. Air valves for sewage service shall have elongated cylindrical chambers. All valves shall provide the following: 1/2-inch clearance around the float in the chamber; minimum size 1/2-inch isolation valve and quick-disconnect couplings at the valve venting for back-flushing; blowoff port and valve at the bottom of the chamber; and

inlet valve at the valve inlet. A back-flushing assembly shall be provided for all valves. The back-flushing assembly shall consist of an inlet shutoff valve, a flush valve, a clear water inlet valve, rubber supply hose, and quick-disconnect couplings. Type 140 valves shall be air-release valves. Valves shall be APCO 450 Series, Val-Matic Model 49ABW, or equal.

C. Gate Valves

1. Valves 4 inches and larger for buried service operation shall be of cast- iron or ductile-iron body construction and conform to AWWA C509 for resilient seated gate valves. The valve design shall incorporate non-rising stems and "O" ring stem seals. Valves shall open counterclockwise. Valves shall be designed for bubble tight shutoff to flow in either direction. Before shipment, the valve manufacturer shall test each valve to 200 psi pressure differential in both directions. The valve interior shall be epoxy coated on the entire ferrous surface of the waterway. The valve exterior shall be coated in accordance latest standards. Buried valves shall be equipped with standard 2-inch-square operating nuts.

2. Buried valves 4 inches and larger shall have mechanical joint ends, conforming to AWWA C111/A21.11.

3. Gate valves shall be manufactured by Mueller, American/Darling, Clow,or approved equal in accordance with the Okeechobee Utility Authority Manual of Standards.