

## SECTION 7389 (Proposed)

### STEEL REINFORCED HIGH DENSITY POLYETHYLENE PIPE & FITTINGS FOR STORM DRAIN & SANITARY SEWER

#### 7389.1 GENERAL:

This specification covers the requirements of Steel Reinforced Polyethylene Pipe (SRPE) profile reinforced and corrugated (Type S or Type D) high density polyethylene (HDPE) pipe manufactured per ASTM F2562/F894, AASHTO M-252 or AASHTO M-294 for gravity flow or, low pressure storm drains, irrigation and sanitary sewer systems. When noted on the plans or in the special provisions, gravity flow, low pressure storm drains, irrigation and sanitary sewers may be constructed using SRPE/HDPE pipe. The SRPE/HDPE pipe will be of the sizes 824 inch diameter through 120 inch diameter. For the purpose of this specification, testing at, low pressure is defined as the test pressures of 3.5 psi of air or 4 feet of water as specified in Section 615.11.

All Gasketed pipe joints shall conform to the controlled pressure test of 10.815.0 psi of air or 2534.5 feet of water as measured in accordance with stipulated in ASTM D3212.

All electro fusion pipe joints shall conform to the controlled pressure test of 30.0 psi of air or 69 feet of water as measured in accordance with ASTM D3212.

The size and class of the SRPE/HDPE pipe to be furnished shall be designed by the Engineer and shown on the plans or in the project specifications. At no time will the class designed be less than Class I-RSC-63 for profile pipe, or minimum equivalent Pipe Stiffness (PS) for corrugated pipe per the requirements of ASTM F2562/AASHTO M-252 or AASHTO M-294.

#### 7389.2 MATERIALS:

**7389.2.1 Base Steel Materials Composition:** Continuous high strength galvanized ribs shall be cold rolled steel meeting the requirements of either ASTM A1008 or ASTM A1011 with minimum yield strength of 80,000 psi. Steel ribs shall be completely encased within the HDPE profile. Profile pipe base material and fittings shall, in accordance with ASTM F894, be made from a PE plastic compound meeting the requirements of Type III, Class C, Category 5, Grade P34 as defined in ASTM D1248 and with established hydrostatic design basis (HDB) of not less than 1250 psi for water at 73.4 degrees F as determined in accordance with Method ASTM D2837. Materials meeting the requirements of cell classification PE 334433-C or higher cell classification, in accordance with ASTM D3350 are also suitable. Corrugated pipe base material shall comply with the requirements of AASHTO M 252 (Type S) or AASHTO M-294 (Type S or D) and have a minimum cell classification PE-335420C.

**7389.2.2 Other Pipe HDPE Materials Composition:** SRPE pipe HDPE material and fittings shall, in accordance with ASTM 2562, be made from HDPE plastic compound meeting the minimum requirements of cell classification 335464C or higher cell classification, in accordance with ASTM D3350. Materials other than those specified under Base Materials shall comply with ASTM F894, AASHTO M-252 or AASHTO M-294.

**7389.2.3 Gaskets:** Rubber gaskets shall be manufactured from a natural rubber, synthetic elastomer or a blend of both and shall comply in all respects with the physical requirements in ASTM F477.

**7389.2.4 Water Stops:** Water stops shall be manufactured from a natural or synthetic rubber and shall conform to the requirements of ASTM C923. The water stop shall have expansion rings, a tension band, or a take-up device used for mechanically compressing the water stop against the pipe.

**7389.2.5 Thermal Welding Material:** The material used for thermally welding the pipe material shall be compatible with the base material.

**7389.2.6 Lubricant:** The lubricant used for assembly shall comply to manufacturer's recommendations and have no detrimental effect on the gasket or pipe.

**7389.2.7 Other Materials:** Materials other than those specified above shall comply with ASTM F2562.

## SECTION 7389 (Proposed)

### 7389.3 JOINING SYSTEMS:

**7389.3.1 Gasket Type:** ~~Steel reinforced bell and spigot joints~~Joints for the piping system and fittings shall consist of an integrally formed bell and spigot gasketed joint. The joint shall be designed so that when assembled, the elastomeric gasket ~~located on the spigot~~ is compressed radially on the pipe or fitting bell to form a water tight seal. The joint shall be designed so to prevent displacement of the gasket from the joint during assembly and when in service. The elastomeric gasket shall meet the provision of ASTM F477.

All pipes shall have a home mark on the spigot end to indicate proper penetration when the joint is made.

The bell and spigot configurations for the fittings shall be compatible to those used for the pipe.

Joints shall provide a seal against exfiltration and infiltration. All surfaces of the joint upon which the gasket may bear, shall be smooth and free of any imperfections, which would adversely affect seal ability. The assembly of the gasketed joints shall be in accordance with the pipe manufacturer's recommendations.

**7389.3.2 Thermal Weld Type:** ~~Electro fusion (EF) joints shall utilize plain ended pipe welded together by internal pressure testable couplers. The internal couplers shall have a minimum wall thickness equal to or greater than the pipe wall thickness as defined in pipe specification, ASTM F2562. The assembly of the welded joints shall be in accordance with the manufacturer's recommendations.~~

~~The pipe ends shall consist of an integrally formed bell and spigot, with or without the elastomeric centering gasket, which join together to form an interface between bell and spigot, such that it is suitable to seal by thermal weld using the extrusion welding process, in accordance with the manufacturer's recommended procedure.~~

~~Thermal welded joints may be effected by welding from inside the pipe or outside, or both.~~

~~The assembly of the welded joints shall be in accordance with the manufacturer's recommendations.~~

~~Thermal welded joints shall be used only when specified on plans or in specifications.~~

### 7389.4 FITTINGS:

Fittings for ~~SRPEHDPE profile wall or corrugated~~ pipe may include tees, elbows, manhole adapter rings, plugs, caps, adapters and increasers. Fittings shall be joined by gasket type or thermal weld type joints in accordance with Subsection ~~7389.3~~.

A clamp gasket or approved method shall be provided at manhole entry or connection to reduce infiltration and exfiltration. Where precast manholes are used, entrance holes must be large enough to allow for proper grouting around the manhole gasket. A non-shrink grout shall be used for grouting.

### 7389.5 CERTIFICATION:

The manufacturer shall furnish an affidavit (certification) that all materials delivered shall comply with the requirements of ASTM ~~F2562894 or AASHTO M 252~~.

~~Pipe and resin producers that manufacture according to AASHTO M 294 shall be certified according to the Plastic Pipe Institute protocol for their Third Party Certification Program.~~

### 7389.6 DIMENSIONS AND TOLERANCES:

~~Profile wall SRPEHDPE~~ pipe dimensions shall comply with dimensions given in Table ~~42~~ of ASTM ~~F2562894~~. The "average or nominal inside diameter" of profile wall ~~SRPEHDPE~~ pipe shall not deviate from its ~~published inside diameter~~normal pipe size by more than as specified in ~~Section 6.2.3~~Table ~~1~~ of ASTM ~~F2562894~~.

~~Corrugated HDPE pipe dimensions shall be "nominal inside diameter" dimensions and shall not deviate from its nominal pipe size by more than the minimum and maximum tolerances as described in AASHTO M 252 or AASHTO M 294, Section 7.2.3.~~

## SECTION 7389 (Proposed)

~~Profile pipe shall have a Ring Stiffness Constant (RSC) or Pipe Stiffness (PS) as shown on the plans. The minimum RSC for profile HDPE pipe shall be RSC-63. The minimum PS for corrugated pipe shall be as shown in AASHTO M-252 (Section 7.5) or AASHTO M-294 (Section 7.4), and tested per ASTM D2412. In no case shall the minimum PS be less than the equivalent PS value for RSC-63.~~

### ~~738.7 CLASSIFICATIONS:~~

~~HDPE profile reinforced pipe products shall be made in four standard Ring Stiffness Constant (RSC) classifications, 40, 63, 100 and 160. These are referred to as RSC 40, RSC 63, RSC 100 and RSC 160. The RSC test shall be conducted in accordance with ASTM D2412 with the exceptions listed in accordance with ASTM F894. HDPE corrugated pipe (Type S or Type D) shall meet the minimum Pipe Stiffness (PS) requirements of AASHTO M-252 or AASHTO M-294. The PS test shall be conducted in accordance with ASTM D2412 with the exceptions listed in accordance with AASHTO M-252 or AASHTO M-294.~~

### ~~7389.87 MARKINGS:~~

~~Markings on pipe shall be per ASTM F2562894, AASHTO M-252 or AASHTO M-294. These markings shall be clearly shown on the pipe at intervals of approximately 12 feet and include but not limited to the following: the manufacturer's name or trademark, nominal size, the specification designation, plant designation code, date of manufacture or an appropriate code. All fittings shall be marked with the designation number of the specification and with the manufacturer's identification symbol. In addition, manufacturers of corrugated HDPE, AASHTO M-294, shall print on or affix the appropriate Plastic Pipe Institute Program Mark on each length of pipe produced that meets the requirements of the program.~~

### ~~7389.98 CARE OF PIPE AND MATERIALS:~~

Care of pipe materials shall comply with Subsection [736.5](#).

~~SRPEHDPE profile reinforced RSC type pipe in shipping and/or storage shall be stacked per manufacturer's recommendation, but in no case higher than 4 rows, not be stacked higher than three rows for pipes 21 inches in diameter or less, nor higher than two rows for pipes 24 to 36 inches in diameter inclusive. Pipe shall not be stacked, shipped, or stored with weight on the bells of the pipe.~~

~~Corrugated HDPE pipe in shipping and storage shall be stacked per manufacturer's recommendation, but in no case higher than 5 rows for pipe 24 inches or less in diameter, or 3 rows for pipe greater than 24 inches in diameter.~~

~~Pipe that is gouged marred or scratched forming a clear depression shall not be installed and shall be removed if damaged in the installation.~~

*- End of Section -*