703 Sanitary Sewer Pipe and Manholes

703.01 General

A. Description

This work includes furnishing and constructing sanitary sewers, manholes, and appurtenances along the lines and grades indicated in the Contract Documents or as directed by the Engineer.

B. Submittal Requirements

Refer to Section 700.01 B for submittal requirements.

703.02 Material Requirements

A. General

Refer to Section 700.02 for general material requirements, in addition to the following requirements.

Portland cement for sanitary and combined sewer applications shall conform to the requirements for Type II Cement in accordance with ASTM C150, Specification for Portland Cement, including Table 2 (Equivalent alkalis requirements only) and Table 3.

B. Sanitary Sewer Pipe and Fittings

1. General

Sanitary sewer pipe constructed within the right-of-way or easement shall be plastic lined reinforced concrete pipe (RCP), vitrified clay pipe (VCP), solid wall polyvinyl chloride (PVC) pipe, ductile iron pipe (DIP), or centrifugally cast fiberglass polymer mortar (fiberglass) pipe.

2. Plastic Lined Reinforced Concrete Pipe (RCP)

a. RCP Certification

All RCP shall be manufactured by a plant certified under the American Concrete Pipe Association's (ACPA) "Quality Cast" Plant Certification Program. All RCP delivered to the jobsite shall be stamped with the "Q-Cast" certification stamp. Visual inspections for defects shall continue to take place on the site.

b. Sanitary Sewer RCP

Lifting holes shall not be used for sanitary sewer RCP.

Sanitary sewer RCP shall be in accordance with ASTM C361, Standard Specification for Reinforced Concrete Low Head Pressure Pipe.

c. RCP Joints and Gaskets

Joints for sanitary sewer RCP shall use a rubber gasket in accordance with ASTM C443, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets, or a confined "o-ring" gasket in accordance with ASTM C361, Standard Specification for Reinforced Concrete Low Head Pressure Pipe. The joint shall be designed to limit the gasket deformation for not less than fifteen (15) percent or more than fifty-five (55) percent deformation.

d. Plastic Lining for RCP

The RCP shall be completely lined with a seamless liner. All liner plates furnished shall be composed of chemically inert synthetic resin, pigments and plasticizers (PVC only)

suitably compounded and processed; formed under pressure into permanently flexible sheets; and not less than sixty-five thousandth (0.065-in) inch thick. Polyvinyl chloride (PVC) or high density polyethylene (HDPE) resin shall constitute not less than ninety-nine (99) percent by weight of the resin used in the formulation. Copolymer resins shall not be permitted.

3. Vitrified Clay Pipe (VCP)

a. General

VCP and fittings shall be extra strength in accordance with ASTM C700, Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated.

The bearing strength tests shall be conducted in accordance with ASTM C301, Standard Test Methods for Vitrified Clay Pipe.

b. VCP Joints and Gaskets

Joints for VCP shall be in accordance with ASTM C425, Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings. All clay pipe joints shall consist of two sealing components, where one component is bonded to the outside of the clay spigot and the other component is bonded to the inside of the clay bell. Polyvinyl chloride (PVC) coupling collars or wrapping of the joint exterior with any material shall not be allowed.

4. Polyvinyl Chloride (PVC) Pipe

a. General

Additives and fillers, including but not limited to stabilizers, antioxidants, lubricants, colorants, etc., shall not exceed ten (10) parts by weight per one-hundred (100) of PVC resin in the compound.

(i) Solid Wall PVC Pipe

Solid wall PVC pipe shall be in accordance with ASTM D3034, Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings. Solid wall PVC pipe and fittings having an inside diameter of less than or equal to six (6) inches shall be in accordance with SDR 23.5. Solid wall PVC pipe and fittings having an inside diameter greater than or equal to eight (8) inches shall be in accordance with SDR 26.

Solid wall PVC pipe and fittings having an inside diameter of eighteen (18) inches and greater shall be in accordance with ASTM F679, Standard Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings.

b. PVC Joints and Gaskets

Joints for solid wall and corrugated PVC pipe shall be in accordance with ASTM D3212, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals. Gaskets for PVC pipe shall be in accordance with ASTM F477, Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.