

October 25, 2007

Section XXXXX

Reinforced Concrete Storm Sewer Pipe

Part 1 - General

1.01 Scope of Work

Furnish all labor, materials, equipment and incidentals necessary to manufacture and test reinforced concrete gravity sewer pipe and fittings as shown on the drawings and specified herein.

1.02 Reference Specifications

Except as modified or supplemented herein, all precast reinforced concrete pipe shall conform to the applicable requirements of the following specifications, latest edition.

ASTM C 76	Standard Specifications for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
ASTM C 506	Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C 507	Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
ASTM C 655	Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM C1417	Standard Specification for Manufacture of Reinforced Concrete Sewer, Storm Drain, and Culvert Pipe for Direct Design

1.03 Submittal Data

A. The contractor shall submit to the Engineer certifications verifying that all pipe and related products supplied meet the applicable specifications and requirements of this standard. If required by the engineer pipe product details showing joint and pipe dimensions shall be included in the submittal information

1.04 Design

A. Reinforced Concrete pipe shall be manufactured in accordance with ASTM C 76, ASTM C 655, ASTM C 506, and ASTM C 507 and designed using the indirect method shown in the American Concrete Pipe Association Design Data 40. As an alternate to the indirect design methods described in Design

Data 40, reinforced concrete pipe is permitted to be manufactured in accordance with ASTM C 1417, and designed using direct design procedures per ASCE 15-98 Standard Practice for Direct Design of Buried Precast Concrete Pipe Using Standard Installations (SIDD). For pipe installed below the water table, an analysis shall be required, checking for possible flotation.

- B. When hydraulically sizing the reinforced precast concrete pipe, a Manning's 'n' value of 0.012 shall be used.

1.05 Materials & Manufacture

Except as otherwise specified herein, all pipe and appurtenances shall conform to the applicable ASTM or ASCE Standard. Submittal data shall include all materials associated with the pipe product. The strength designation of the pipe shall be as specified on the Drawings or as submitted by the manufacturer.

- A. Circular reinforced concrete culvert and storm sewer pipe shall be in accordance with ASTM C 655, ASTM C 76, A, B or C wall type and class II, III, IV, V or special design as shown, or ASTM C1417. Gasketed joints shall be bell and spigot with rubber gasket seal in accordance with ASTM C 443. Tongue and groove joints shall be sealed with mortar or preformed flexible sealant per ASTM C 990, or other suitable sealant. Pipe with elliptical reinforcing or quadrant mats shall be clearly marked to indicate the top of the pipe or have a lift hole or lift anchors to ensure proper orientation.
- B. Arch Reinforced concrete culvert and storm sewer pipe shall be in accordance with ASTM C 506. Joints shall be tongue and groove sealed with mortar or preformed flexible sealant per ASTM C 990, or other suitable sealant.
- C. Elliptical reinforced concrete elliptical culvert and storm sewer pipe shall be in accordance with ASTM C 507. Joints shall be tongue and groove sealed with mortar or preformed flexible sealant per ASTM C 990, or other suitable sealant.

2.01 Acceptance Testing

- A. Reinforced concrete pipe to be installed under this contract shall be inspected and tested at the place of manufacture as required by the Standard Specifications to which the material is manufactured. The Engineer or his representative shall be informed prior to any testing and may be present for or have a representative witness any and all testing. The Engineer will be provided copies of all test reports.

2.02 Repairs & Inspection

- A. Pipe may be repaired if necessary because of occasional imperfections in manufacture or damage during handling. All repaired pipe will be considered

acceptable if the repairs are sound, properly finished and conform to the requirements of the specifications.

- B. Pipe shall be subjected to rejection on account of failure to conform to any of the specification requirements.

3.01 Performance Assurance

- A. When requested the contractor shall submit to the Owner the pipe manufacturer's Quality Control Program for review. The QC program and standards of manufacturing must be established and well defined.

4.01 Pipe Laying

- A. Care shall be taken in loading, transporting, and unloading to prevent damage to the pipe.
- B. Preparation of bedding and backfill shall be as specified on the Drawings and per the requirements of the American Concrete Pipe Association's Design Data 40 or ASTM C 1479. Pipe shall be laid with uniform bearing under the barrel of the pipe. For projecting bell pipe, bell holes shall be provided.
- C. Pipe shall not be laterally displaced by pipe embedment material installed as provided in the Drawings. No pipe shall be laid in unsuitable bedding conditions. Pipe shall be laid with bell ends facing the direction of laying except when making closures.
- D. Rubber gaskets shall be installed in strict conformance with the pipe manufacturer's recommendations.
- E. Pipe shall be laid to line and grade as shown on the plans. Adjustments in grade by exerting force on the barrel of the pipe with excavating equipment or by lifting and dropping the pipe shall be prohibited. If the installed pipe section is not on grade, the pipe section shall be completely unjoined, the grade corrected, and the pipe then rejoined. Curves may be formed using fittings, specials, beveled end pipe or unsymmetrical joint closure of straight pipe.