

SECTION 02615

CONCRETE STORM PIPE

PART 1 GENERAL

1.01 SUMMARY

- A. This section addresses concrete storm pipe, and includes all labor, acceptable materials, equipment, and construction practices which are to be used in the installation of concrete storm pipe.
- B. Relate Work Specified Elsewhere:
 - 1. Section 01666 - Testing Storm Sewer System
 - 2. Section 02722 – Storm Sewer Collection System
- C. Measurement and Payment Procedures
 - 1. For public funded capital improvement projects, measurement and payment procedures will be determined on a project by project basis.
 - 2. For privately funded development projects, Owner will determine measurement and payment requirements.

1.02 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M170 – Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
 - 2. AASHTO M242 – Reinforced Concrete Culvert, Storm Drain, and Sewer Pipes.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM C33 – Standard Specification for Concrete Aggregates
 - 2. ASTM C76 – Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
 - 3. ASTM C150 – Standard Specification for Portland Cement
 - 4. ASTM C361 – Standard Specification for Reinforced Low-Head Pressure Pipe
 - 5. ASTM C443 – Standard Specification for Circular Concrete sewer and Culvert Pipe, Using Rubber Gaskets.
 - 6. ASTM C506 – Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain and Sewer Pipe
 - 7. ASTM C507 – Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe
 - 8. ASTM C655 – Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
 - 9. ASTM C877 - Specifications for External Sealing Bands for Noncircular Concrete Sewer, Storm Drain and Culvert Pipe
 - 10. ASTM C990 - Specification for Joints for Concrete Pipe, Manholes and Precast Box Sections using Preformed Flexible Joint Sealants
 - 11. ASTM C1433 – Specifications for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains and Sewers.
 - 12. ASTM E329 – Standard Practice for Use in the Evaluation of Testing and Inspection Agencies as Used in Construction.

13. ASTM C1577 – Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains and Sewers Designed according to ASSHTO LRFD.
14. ASTM C1677 – Standard Specification for Joints for Concrete Box, using Rubber Gaskets.

C. Where reference is made to one of the above standards, the latest revision shall apply.

1.03 SUBMITTALS:

- A. Submit to Inspector, the name of the pipe and fitting suppliers and a list of materials to be furnished.
- B. Submit to Inspector, shop drawings showing layout and details of reinforcement, joint, method of manufacture and installation of pipe, specials and fittings, and a schedule of pipe lengths (including length of individual pipes by diameter) for the entire project.
- C. Complete specifications and data covering the materials to be furnished and detailed drawings covering the installation shall be submitted to the Inspector.
- D. Prior to each shipment of pipe, submit test reports that certify pipe was manufactured and tested in accordance with the ASTM Standards specified herein.

1.04 QUALITY ASSURANCE

- A. See Section 01010-1.08.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Handling
 1. Deliver and handle pipe in a manner which will prevent damage to the pipe.
 2. Do not drop pipe or fittings.
 3. Care must be taken to prevent damage to the pipe and fittings from bending, compression or abrasion.
 4. Do not install damaged pipe or fittings.
- B. Storage
 1. Do not store or handle lubricant in a manner which will cause contamination to the lubricant.
 2. Store rubber gaskets in a location which protects them from deterioration or damage.
 3. Store pipe in accordance with the manufacturer's specifications.
 4. Store pipe on a surface which provides even support for the pipe barrel.
 - a. Do not store pipe in such a way that it will be supported by the bell.

PART 2 PRODUCTS

2.01 REINFORCED CONCRETE PIPE (RCP) & REINFORCED CONCRETE BOX (RCB)

- A. Class, diameter and length as detailed and shown on drawings.
- B. All pipes shall have circular cross section unless accepted otherwise in advance by the Inspector. Elliptical or arch pipe or box sections may be used only in locations where field conditions would prevent use of circular pipe.

- C. All circular pipe and all fittings shall conform to ASTM C76 and be minimum Class III, have circular reinforcing, be not less than 18 inch inside diameter and minimum nominal laying length of 7 feet 6 inches.
- D. All elliptical pipe, if accepted for use, shall conform to ASTM C507 and be minimum Class HE-III or HE-IV and not be less than 18 inch equivalent.
- E. All arch pipes, if accepted for use, shall conform to ASTM C506 and be minimum Class III and be not less than 12-inches in rise height.
- F. All box sections, if accepted for use, shall conform to ASTM C 1433 or ASTM C1577 designed for depth of cover and loading conditions anticipated at the field site and as shown on project plans.

2.02 JOINTS

- A. All joints on circular pipe shall be push-on bell and spigot type, and shall be manufactured in accordance with ASTM C443 and ASTM C361.
 - 1. All gaskets shall be of o-ring or profile type and manufactured in accordance with ASTM C443. No bituminous sealer will be used (i.e. Con Seal).
 - 2. Use the pipe manufacturer specified lubricant or pre-lubricated gasket.
- B. All joints on arch and elliptical pipe shall be tongue and groove with a double layer of flexible joint seal compound standard with the pipe manufacturer and as accepted by the Inspector.
 - 1. As water tight gasket technology evolves to a point where two (2) or more manufacturers offer a water tight gasket manufactured in accordance with ASTM C443, all arch and elliptical pipe shall contain a water tight gasket and the double layer of flexible joint seal compound shall no longer be allowed.
 - 2. Use the pipe manufacturer specified lubricant or pre-lubricated gasket with the water tight gasket.
- C. All joints on box culverts shall be tongue and groove with a double layer of flexible joint seal compound standard with the box manufacturer and as accepted by the Inspector.
 - 1. As water tight gasket technology evolves to a point where two (2) or more manufacturers offer a water tight gasket manufactured in accordance with ASTM C1677, all box culverts shall contain a water tight gasket and the double layer of flexible joint seal compound shall no longer be allowed.
 - 2. When using a water tight gasket, the bottom portion of the gasket shall be glued to the box at the plant.
 - 3. Use the pipe manufacturer specified lubricant or pre-lubricated gasket with the water tight gasket.

2.03 REINFORCED CONCRETE END SECTIONS

Precast reinforced concrete end sections shall have:

- 1. At least one line of reinforcement conforming to the requirements of AASHTO M170 equivalent to the square inches per linear foot for elliptical reinforcement in circular pipe, Class II, Wall B, or
- 2. Synthetic Macro Fiber Reinforcement: Monofilament polypropylene/polyethylene fibers conforming to ASTM C1116, Type III having an aspect ratio between 65 and 70 and a minimum tensile strength of 80 KSI. The macro fiber lengths shall be between 2.0 and 2.5 inches long. The macro fiber quantity shall be 5.0 pounds/cubic yard.

PART 3 EXECUTION

3.01 TRENCHING, BACKFILLING AND COMPACTING:

- A. Section 02221 specifies trenching, backfilling and compacting of pipe.

3.02 INSTALLATION:

- A. Pipe Installation: See Section 02722.

3.03 TESTING

- A. Section 01666 specifies pipe testing.

END OF SECTION