

## SECTION 40 05 39

### CONCRETE PROCESS PIPE

#### PART 1 – GENERAL

##### 1.1 DESCRIPTION

###### A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals shown, specified, and required to furnish and install concrete drainage pipe and fittings.
2. Extent of concrete pipe to be provided is shown and specified in piping schedules included in Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation.

###### B. Coordination:

1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before concrete pipe Work.

###### C. Related Sections:

1. Section 33 05 05, Buried Piping Installation.
2. Section 40 05 05, Exposed Piping Installation.

##### 1.2 REFERENCES

###### A. Standards referenced in this Section are:

1. AASHTO, Policy on Geometric Design of Highways and Streets.
2. ANSI/ASTM A27/A27M, Specification for Steel Castings, Carbon, for General Application.
3. ANSI/ASTM A36/A36M, Specification for Carbon Structural Steel.
4. ANSI/ASTM A82, Specification for Steel Wire, Plain for Concrete Reinforcement.
5. ANSI/ASTM A185, Specification for Steel Welded Wire Reinforcement, Plain for Concrete.
6. ANSI/ASTM A283/A283M, Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
7. ANSI/ASTM A496, Specification for Steel Wire, Deformed, for Concrete Reinforcement.
8. ANSI/ASTM A497/A497M, Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
9. ANSI/ASTM A615/A615M, Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
10. ANSI/ASTM A663/A663M, Specification for Steel Bars, Carbon, Merchant Quality Mechanical Properties.

11. ANSI/ASTM A1011/1011M, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
12. ANSI/ASTM A1018/1018M, Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Carbon, Commercial, Drawing, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
13. ANSI/ASTM C14, Specification for Concrete Sewer, Storm Drain and Culvert Pipe.
14. ANSI/ASTM C33, Specification for Concrete Aggregates.
15. ANSI/ASTM C76, Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe.
16. ANSI/ASTM C118, Specification for Concrete Pipe for Irrigation or Drainage.
17. ANSI/ASTM C150, Specification for Portland Cement.
18. ANSI/ASTM C361, Specification for Reinforced Concrete Low-Head Pressure Pipe.
19. ANSI/ASTM C444, Specification for Perforated Concrete Pipe.
20. ANSI/ASTM C507, Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe.
21. ANSI/ASTM C595, Specification for Blended Hydraulic Cements.
22. ANSI/ASTM C1433, Specification for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains and Sewers.
23. ANSI/AWWA C207, Steel Pipe Flanges for Waterworks Service-Sizes 4-inch through 144-inches.
24. ANSI/AWWA C300, Reinforced Concrete Pressure Pipe, Steel Cylinder Type.
25. ANSI/AWWA C301, Prestressed Concrete Pressure Pipe, Steel Cylinder Type.
26. ANSI/AWWA C302, Reinforced Concrete Pressure Pipe, Non-Cylinder Type.
27. ANSI/AWWA C303, Concrete Pressure Pipe, Bar-wrapped, Steel Cylinder Type.

### 1.3 QUALITY ASSURANCE

#### A. Qualifications:

##### 1. Manufacturer:

- a. Manufacturer shall have a minimum of five years of experience producing concrete pipe and fittings, and shall be able to document satisfactory service in at least five installations, each in service for at least 5 years.

#### B. Component Supply and Compatibility:

1. Each type of concrete pipe and associated fittings shall be products of one manufacturer.
2. Concrete pipe Supplier shall review, approve, and prepare all Shop Drawings and submittals for all components furnished under this Section.
3. Components shall be suitable for specified service conditions.

- C. Quality of materials, process of manufacture, and finished pipe shall be subject to inspection by ENGINEER.

#### 1.4 SUBMITTALS

- A. Action Submittals: Submit the following:
  - 1. Shop Drawings:
    - a. Detailed drawings and data on piping and fittings, where applicable, and appurtenances. Submit with Shop Drawings required under Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation.
  - 2. Product Data:
    - a. Detailed product data on pipe, fittings, gaskets, fastening hardware where applicable, and appurtenances. Submit with Shop Drawings required under Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation.
- B. Informational Submittals: Submit the following:
  - 1. Certifications:
    - a. Submit certificate signed by manufacturer of each product certifying that products conform to applicable referenced standards.
  - 2. Supplier Instructions:
    - a. Pipe manufacturer instructions for handling, storing, and installing products.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation.

### PART 2 – PRODUCTS

#### 2.1 SYSTEM PERFORMANCE

- A. General:
  - 1. Pipe shall be designed for an external live loading, including impact, equal to AASHTO H-20 loading with earth cover as shown.
- B. Service Conditions:
  - 1. Liquid Service: Stormwater, Plant Drains including filter backwash waste.
  - 2. Maximum Working Pressure (psi): NA.
  - 3. Maximum Transient Pressure (psi): NA.
  - 4. pH Range of Pipe Contents: Greater than 5.0.
  - 5. Pipe Inside Diameter (feet): Varies.
  - 6. Type of Joint: Rubber Gasket.
  - 7. Pressure Rating of Pipe (psi or feet of water): 30 feet of water.

8. Pipe Overburden and Trench Bedding Condition: As shown on Drawings.

## 2.2 MATERIALS, CONCRETE PRESSURE PIPE

- A. Pipe and fittings shall conform to requirements of ANSI/AWWA C302. Pipe shall have the following features: reinforcing cage or cages of steel rods, bars, wire, or welded wire reinforcement; wall of dense concrete covering the reinforcing cage or cages inside and out; and watertight preformed rubber gasket. Fittings shall be fabricated from welded steel sheet or plate, and be lined and coated with cement mortar.
- B. Pipe Materials:
  1. Cement for concrete work in accordance with ANSI/ASTM C150, Type I.
  2. Aggregates for concrete work in accordance with ANSI/ASTM C33.
  3. Steel for cylinders, joint and fittings in accordance with ANSI/ASTM A1011/1011M, ANSI/ASTM A1018/1018M or ANSI/ASTM A283/A283M.
  4. Steel for reinforcing in accordance with ANSI/ASTM A663/A663M, Grade 80; ANSI/ASTM A615/A615M, Grade 40; or ANSI/ASTM A497/A497M.
  5. Rubber for gaskets shall contain not less than 50 percent by volume of first-grade natural crude or first-grade synthetic rubber. Remainder of compound shall consist of pulverized fillers, free of rubber substitutes, reclaimed rubber, and other deleterious substances.

## 2.3 MATERIALS, REINFORCED CONCRETE PIPE FOR CULVERTS, STORM DRAINS, AND SEWERS

- A. Pipe and fittings shall conform to requirements of ANSI/ASTM C76. Pipe shall be free of fractures and surface roughness. Ends of pipe shall be normal to the walls and center of pipe. Joints shall be designed so that, when sections are laid together, they make a continuous line of pipe with smooth interior free of irregularities in flow line.
- B. Pipe Materials:
  1. Cement for concrete work shall be in accordance with, ANSI/ASTM C150 or ANSI/ASTM C595.
  2. Aggregates shall conform to ANSI/ASTM C33.
  3. Steel wire bar reinforcement shall be in accordance with ANSI/ASTM A82 or ANSI/ASTM A496.
  4. Steel wire fabric reinforcement shall be in accordance with ANSI/ASTM A185.
- C. Pipe shall be Class V. Quality of materials, process of manufacture, and finished pipe shall be subject to inspection and approval by ENGINEER.

## 2.4 MARKING FOR IDENTIFICATION

- A. All pipeline materials shall be stamped, marked, or identified with the following information:
  - 1. Name or trademark of manufacturer.
  - 2. Pipe class and specification designation.
  - 3. Size and length dimensions.
  - 4. Date and place of manufacture.
  - 5. Pipe 24-inches and larger shall also be marked on pipe interior as above.
  - 6. Name of OWNER.

### PART 3 – EXECUTION

#### 3.1 INSTALLATION

- A. For buried piping installation, refer to Section 33 05 05, Buried Piping Installation.
- B. For exposed piping installation, refer to Section 40 05 05, Exposed Piping Installation.

++ END OF SECTION ++