

SECTION 02501

DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Ductile iron pipe and fittings for water lines, wastewater force mains, gravity sanitary sewers, and storm sewers.

1.02 MEASUREMENT AND PAYMENT

A. Unit Prices.

- 1. No separate payment will be made for ductile iron pipe and fittings under this Section, with the exception of extra fittings in place. Include cost in unit prices for work as specified in the following Sections, as applicable:

- a. Section 02511 - Water lines
- b. Section 02531 - Gravity Sanitary Sewers
- c. Section 02532 - Sanitary Sewage Force Mains
- d. Section 02631 - Storm Sewers

- 2. Refer to Section 01270 - Measurement and Payment for unit price procedures.

- B. Extra Ductile Iron Compact Fittings in Place shall be for additional fittings required to complete job. This is not to exclude extension of pipe across driveway or intersection for purpose of terminating line in more advantageous position. This determination shall be at discretion of Public Works. This bid item includes additional fittings as may be necessary to complete job in conformance with intent of Drawings.

- C. Stipulated Price (Lump Sum). If Contract is Stipulated Price Contract, payment for work in this Section is included in total Stipulated Price.

1.03 REFERENCES

- A. ANSI A 21.4 (AWWA C 104) - Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings, for Water.
- C. ANSI A 21.11 (AWWA C 111) - Standard for Rubber Gasket Joints for

Ductile-Iron Pressure Pipe and Fittings.

- D. ANSI A 21.15 (AWWA C 115) - Standard for Flanged Ductile-Iron Pipe With Ductile-Iron or Gray-Iron Threaded Flanges.
- E. ANSI A 21.51 (AWWA C 151) - Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water and Other Liquids.
- F. ANSI A 21.53 (AWWA C 153) - Standard for Ductile Iron Compact Fittings, 3-In. through 24-In. and 54-In. through 64-In. for Water Service.
- G. ANSI A 21.5 (AWWA C 105) – Polyethylene Encasement for Ductile Iron Pipe Systems.
- H. AWWA C 600 - Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.
- I. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe
- J. American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.
- K. American Association of State Highway Transportation Officials (AASHTO).

1.04 SUBMITTALS

- A. Conform to requirements of Section 01330 - Submittal Procedures.
- B. Submit manufacturer's certifications that ductile iron pipe and fittings meet provisions of this Section and have been hydrostatically tested at factory and meet requirements of ANSI A 21.51 (AWWA C 151).
- C. Submit certifications that pipe joints have been tested and meet requirements of ANSI A 21.11.
- D. Submit affidavit of compliance in accordance with ANSI A21.16 for fittings with fusion bonded epoxy coatings or linings.

PART 2 PRODUCTS

2.01 DUCTILE IRON PIPE

- A. Ductile Iron Pipe to conform to the following pressure classes for AWWA C 151, push-on or mechanical joint, based on Type 3 bedding conditions, a depth of bury of 6 feet, and a working pressure of 150 psi.

CITY OF SCHERTZ
STANDARD SPECIFICATION

DUCTILE IRON PIPE AND FITTINGS

3" through 12"	350 psi
16" and 20"	250 psi
24"	200 psi
30" through 64"	150 psi

- B. Provide pipe sections in standard lengths, not less than 18-Ft. long, except for special fittings and closure sections as indicated on shop drawings.
- C. Provide flange adapter with insulating kit as required when connecting new piping to piping of different materials, unless otherwise approved by Public Works.
- D. Each length of pipe furnished shall bear identification markings in conformance with Sec. 51.10 of AWWA Standard C151.

2.02 JOINTS

- A. Joint Types: Provide push-on joints unless otherwise indicated on the Drawings or required by these specifications. All rubber joint gaskets utilized on ductile-iron pipe shall be conformance with ANSI/AWWA C111/A21.11 Standard, latest revision. For bolted joints, conform to requirements of AWWA C111.
- B. Where required by Drawings, provide approved restrained joints for buried service.
- C. Threaded or grooved-type joints which reduce pipe wall thickness below minimum required are not acceptable.
- D. Provide for restrained joints designed to meet test pressures required under Section 02515 - Hydrostatic Testing of Pipelines or Section 02532 - Sanitary Sewer Force Mains, as applicable. Provide restrained joints for test pressure or maximum surge pressure as specified, whichever is greater for water lines. Do not use passive resistance of soil in determining minimum restraint lengths.
- E. Make curves and bends by deflecting joints. Do not exceed maximum deflection recommended by pipe manufacturer for pipe joints or restraint joints. Submit details of other methods of providing curves and bends for consideration by Public Works. When other methods are deemed satisfactory, install at no additional cost to the City.

2.03 FITTINGS

- A. Use fittings of same size as pipe. Reducers are not permitted to facilitate an off-size fitting. Reducing bushings are also prohibited. Make reductions in piping size by reducing fittings. Line and coat fittings as specified for

pipe they connect to. Use mechanical joint fittings unless otherwise shown in plans.

- B. Push-on Fittings: ANSI A 21.10; ductile iron ANSI A 21.11 joints, gaskets, and lubricants; pressure rated at 250 psig.
- C. Flanged Fittings: ANSI 21.10; ductile iron ANSI A 21.11 joints, gaskets, and lubricants; pressure rated at 250 psig.
- D. Mechanical Joint Fittings: ANSI A 21.11; minimum pressure rated at 250 psi.
- E. Ductile Iron Compact Fittings for Water lines: ANSI A 21.53; 4-In. through 12-In. diameter fusion bonded epoxy-lined or cement mortar lining.

2.04 COATINGS AND LININGS

A Water lines

- 1. Interiors: All pipes shall have an interior cement mortar lining applied in accordance with ANSI/AWWA C104/A21.4, latest revision. No asphaltic coating will be required on the interior cement mortar lining; comply with NSF 61.
- 2. Exterior coating shall consist of a nominal one-mil thick asphaltic material applied to the outside of the pipe as described in Section 51.8 of AWWA C151.

B. Sanitary Sewer and Force Main:

- 1. Preparation: Commercial blast cleaning conforming to SSPC-SP6.
- 2. Liner thickness: Nominal 40-Mils., for pipe barrel interior; minimum 6 to 10-Mils. at gasket groove and outside spigot end to 6-inches back from end.
- 3. Testing: ASTM G 62, Method B for voids and holidays; provide written certification.
- 4. Accepted Interior Lining Materials:
 - a. Provide approved virgin polyethylene conforming to ASTM D 1248, with inert fillers and carbon black to resist ultraviolet degradation during storage; heat bonded to interior surface of pipe and fittings.
 - b. Ceramic Epoxy – Protecto 401
 - c. SewperCoat – double thickness of standard identified ion AWWA C104. A seal coat shall be applied to the lining as

identified on AWWA C104.

5. Exterior: Prime coat and outside asphaltic coating conforming to ANSI A21.10, ANSI A21.15, or ANSI A21.51 for pipe and fittings in open cut excavation and in casings.
- C. Sanitary Sewer Point Repair Pipe: For pipes which will be lined with high density polyethylene liner pipe or cured-in-place liner, provide cement-lined with seal coat in accordance with ANSI A 21.4. For pipes which will not be provided with named liner, provide pipe as specified in Paragraph 2.05B, Sanitary Sewer and Force Main Interiors.
- D. Polyethylene Wrap: For buried pipes not cathodically protected, double wrap with polyethylene wrap unless otherwise specified or shown. Conform to requirements of Section 02528 - Polyethylene Wrap.
- F. For flanged joints in buried service, provide petrolatum wrapping system, Denso, or equal, for the complete joint and alloy steel fasteners. Alternatively, provide bolts made of Type 304 stainless steel.
- G. Pipe to be installed in potentially contaminated areas shall have coatings and linings recommended by the manufacturer for maximum resistance to the contaminants identified in the Phase II Environmental Site Assessment Report.
- H. For water lines cathodically protected, supply ductile iron pipe with either tape coatings or some other bonded dielectric coating as specified in Section 02518 - Steel Pipe and Fittings for Large Diameter Water Lines.

2.05 MANUFACTURERS

- A. Use pre-approved manufacturers listed in the City of Schertz approved products.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Conform to installation requirements of Sections 02511 - Water Lines, 02531 - Gravity Sanitary Sewers, 02532 - Sanitary Sewer Force Mains 02561 - Storm Sewers and 02553 - Point Repairs and Obstruction Removal, except as modified in this Section.
- B. Install in accordance with AWWA C 600 and manufacturer's recommendations.
- C. Install all ductile iron pipe in double polyethylene wrap, unless cathodic

protection is provided. Do not use polyethylene wrap with a cathodic protection system.

D. Holiday Testing.

1. Polyurethane: Conform to requirements of Section 02527 - Polyurethane Coatings for Steel or Ductile Iron Pipe.
2. Fusion Bonded Epoxy: Conform to requirements for new fittings in ANSI A 21.16.

3.02 FIELD REPAIR OF COATINGS

- A. Polyurethane: Conform to requirements of Section 02527 - Polyurethane Coatings for Steel or Ductile Iron Pipe.
- B. Fusion Bonded Epoxy: Conform to requirements for new fittings in ANSI A 21.16.

END OF SECTION