

SECTION 33 41 20 – SOLID WALL PVC GRAVITY SEWER PIPE, WATER PIPE, AND FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: the Work necessary to completely furnish and install Polyvinyl Chloride (PVC) gravity sewer pipe and related fittings.
- B. Related sections:
 - 1. Section 01 33 00 – Submittal Procedures
 - 2. Section 01 60 00 – Product Requirements
 - 3. Section 31 23 16.16 – Trenching for Water and Sewer Lines
 - 4. Section 31 23 23.19 – Trench Bedding and Backfill for Water and Sewer Lines
 - 5. Section 33 31 23 – Testing Sanitary Sewer Systems
 - 6. Section 33 39 17 – Polymer Concrete Manholes
 - 7. Section 33 41 13 – Pipe Laying

1.2 GENERAL

- A. Like items of PVC pipe provided hereinafter shall be the end products of one manufacturer to achieve standardization of appearance, operation, maintenance, and manufacturer's services.
- B. General Requirements: See Division 01, General Requirements, which contains information and requirements that apply to the work specified herein and are mandatory for this project.
- C. All pipe shall be circular and shall be of the sizes shown on the Plans and/or listed in the Unit Price Schedule. All pipe shall be new. Used pipe is prohibited.
- D. At the discretion of the Engineer, all pipeline and materials are subject to inspection and approval at the plant of the manufacturer.
- E. All materials shall equal or exceed the standards specified herein.
- F. During the process of unloading, all pipe materials shall be inspected by the Contractor and any damaged pipe set aside.
- G. After pipelines are laid, the Contractor shall test for defects and leakage as specified in Section 33 31 23, Testing Sanitary Sewer Systems of these specifications.
- H. Inspection of pipe at the manufacturer's plant, at the point of delivery, on the job site, or in place shall not relieve the Contractor of his responsibility and the material may be subject to rejection until final acceptance of the completed project.

1.3 SUBMITTALS

- A. General: Administrative, shop drawings, samples, quality control, and contract closeout submittals shall conform to the requirements of Section 01 33 00, Submittal Procedures.

- B. In addition to the requirements of Section 01 33 00, Submittal Procedures, submit the following additional specific information:
1. Quality Control Submittals:
 - a. Pipe size, class, and thickness.
 - b. Special shipping, storage and protection, and handling instructions.
 - c. Test procedures.
 - d. Test results, reports, and certifications.

PART 2 - PRODUCTS

2.1 General

- A. PVC gravity sewer pipe shall be provided to conform to materials of construction as specified herein.

2.2 PVC FOR WATER LINE

- A. All PVC water pipe 8 inch through 12 inch shall conform to AWWA C900, Class 200 DR 14.
- B. All PVC water pipe shall be blue.
- C. All PVC water pipe 8" through 12" shall be manufactured by Pipelife Jet Stream, Diamond Plastics Corporation, or approved equal.
- D. Make curves by deflecting joints. Do not exceed maximum offset recommended by pipe manufacturer.
- E. Provide Underwriters' Laboratories mark of approval and is acceptable without penalty to Texas State Fire Insurance Committee for use in fire protection lines.
- F. Hydrostatic Test: AWWA C-900 at manufacturer's site. Submit manufacturer's written certification indicating pipe passes test.

2.3 PVC GRAVITY sewer pipe

- A. All PVC gravity sewer pipe, 8 inch through 15 inch, shall conform to AWWA C-900 (DR25).
- B. All PVC gravity sewer pipe shall be green.
- C. All PVC gravity sewer pipe 8" through 15" shall be manufactured by JM Eagle, Diamond Plastics Corporation, or approved equal.
- D. PVC gravity sewer pipe 18 inch and larger shall be manufactured in accordance with ASTM F679 (PVC Large Diameter Plastic Gravity Sewer Pipe and Fittings).
- E. All PVC pipe shall have a minimum pipe stiffness of 165 psi at 5% deflection.
- F. The minimum acceptable size of all gravity sewer mains shall be eight (8) inches.

- G. The plastic material used in making the pipe shall be clean, virgin, Cell Classification 12454 or 12364 PVC compound as specified in ASTM D3034 and ASTM F679, conforming to ASTM D1784 (Rigid PVC Compounds and Chlorinated PVC Compounds).
- H. Standard laying lengths shall be 20 feet \pm 1 inch, unless otherwise specified.
- I. All pipe shall be tested in accordance with ASTM D2412, D2152 (Adequacy of Fusion of Extruded PVC Pipe and Molded Fittings by Acetone Immersion), and D2444 (Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)).
- J. Each PVC sewer pipe length shall be clearly marked with the manufacturer's name, nominal pipe size, cell classification, AWWA/ASTM designation, and DR.

2.4 Fittings for pvc gravity sewer

- A. PVC fittings for gravity sewer pipe shall be of one-piece injection-molded construction, with self-cleansing sanitary flow of design meeting ASTM D3034 or F679, as applicable. Fitting types and larger sizes not manufactured as injection molded pieces may be fabricated.
- B. Fittings shall have a wall thickness equal to or greater than the wall thickness of the pipe to which the fitting is joined, meeting or exceeding the adjacent pipe quality requirements and have an SDR of equal to or greater than the adjacent pipe.
- C. Each PVC fitting shall be clearly marked with the manufacturer's name, nominal pipe size, cell classification, AWWA/ASTM designation, and deflection angle if applicable.
- D. Fittings shall only be used for service connections or as shown on plans or as directed by the Engineer. Generally, any change in direction of the gravity sewer line will be facilitated by use of a manhole.

2.5 pvc pipe joints

- A. Joints shall be of the push-on, elastomeric gasket type, conforming to ASTM D3212 (Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals), and/or Uni-Bell UNI-B-01 (Recommended Specification for Thermoplastic Pipe Joints, Pressure and Non-Pressure Applications).
- B. All bells shall be formed integrally with the pipe and shall contain a positively retained, factory installed elastomeric gasket and have a raceway or groove specially formed to accept and retain the gasket.
- C. Wall thickness of the bell at any point shall not be less than the required minimum for the pipe barrel. Pipe spigots shall be beveled and have insertion stop marks.
- D. The use of solvent cement or chemically welded joints shall not be permitted in field construction, except as specifically authorized by the Engineer.
- E. All pipe joints other than those specified herein shall be made in strict accordance with the manufacturer's recommendations and as approved by the Engineer.
- F. All joints shall be made watertight in accordance with the latest applicable AWWA and ASTM standards.

2.6 Gaskets for pvc joints and fittings

- A. Gaskets shall be molded or extruded from a high grade, vulcanized, elastomeric compound consisting of either a basic natural or synthetic rubber.
- B. Gaskets shall be marked for nominal pipe size, manufacturer, and year of manufacture.
- C. Gaskets shall comply with the requirements of ASTM F477 (Elastomeric Seals (Gaskets) for Joining Plastic Pipe) and ASTM D3212.

2.7 PVC Joint and fitting lubricant

- A. Lubricant shall be provided by the pipe manufacturer and applied as per the manufacturer's recommendations.
- B. Lubricant shall be non-toxic, not support the growth of bacteria and have no deteriorating effects on the gasket or pipe material.
- C. Lubricant containers shall be appropriately identified and labeled with the manufacturer's name.
- D. Each lubricant container shall have printed instructions for usage and joint assembly.

PART 3 - EXECUTION

3.1 GENERAL

- A. All pipe and fittings shall be installed in accordance with these specifications and the Plans.

3.2 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section 01 60 00, Product Requirements.
- B. Delivery of Materials: Products shall be delivered in original, unbroken packages, containers, or bundles bearing the name of the manufacturer.
- C. Storage: Products shall be carefully stored in a manner that will prevent damage and in an area that is protected from the elements.

3.3 FIELD QUALITY CONTROL

- A. Contractor shall visually inspect all pipe and fittings upon delivery and set aside and damaged or flawed materials and shall not install any damaged or flawed material.
- B. Contractor shall test for defects and leakage as specified in Section 33 31 23, Testing Sanitary Sewer Systems.

3.4 INSTALLATION

- A. Installation shall be as specified in Section 33 41 19, Pipe Laying.
- B. Pipe bedding and backfill shall be as specified in Section 31 23 23, Trench Backfill.
- C. Pipe connections to concrete manholes and other concrete structures shall be as specified in Section 33 39 13, Concrete Manholes.
- D. Pipe installed within steel encasement shall conform to Section 33 31 13, Steel Encasement Pipe.

PART 4 - MEASUREMENT AND PAYMENT

- 4.1 Payment is on a unit basis for each fire hydrant assembly including 6-inch gate valve and box, installed regardless of barrel depth and coating.**
- 4.2 No separate payment will be made for gate valves. Include payment in unit price for water.**

END OF SECTION -