

**SECTION 02560**

**SEWER LINE CONSTRUCTION**

**PART 1 - GENERAL**

**1.1 Summary**

**A. Description of the Work**

The work to be performed in accordance with this section includes the construction or extension of sewer service lines including appurtenances such as laterals, service taps, clean-outs, and valves.

The work shall include the furnishing of all labor, tools, equipment, materials and performing all operations required to provide a complete item in accordance with the project plans and these specifications.

**B. Related Work Specified Elsewhere**

Pipe Installation.....Section 02535  
Trench Excavation and Backfill.....Section 02300

**1.2 Quality Assurance**

**A. Applicable Test Standards and Specifications**

**1. American Association of State Highway and Transportation Officials (AASHTO)**

**2. American National Standards Institute (ANSI)**

B16.1 - Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800.

B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges.

**3. American Society for Testing and Materials (ASTM)**

A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile.

A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe

D1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)

D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.

D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40

D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems

D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings

D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

F679 - Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

#### **4. American Water Works Association (AWWA)**

AWWA C105 – American National Standard for Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.

### **B. Test Method and Allowable Tolerances**

#### **1. Description**

Test each section of gravity and pressure pipeline for leakage and pressure rating after backfill has been placed

but prior to final surface replacement. **CONTRACTOR** shall perform the following: pressure testing, Mandrel testing, lamping and video inspection. Perform leakage tests with the air test as specified in Section 02535. Test laterals from the main line to property line. Perform deflection test on sections as determined by the **OWNER**.

## **2. Field Pressure Tests**

Perform acceptance tests as specified in Section 02535, Pipe Installation, only in the presence of the **ENGINEER**.

## **3. Deflection Test for PVC Pipe**

In addition to the test described above, the **CONTRACTOR** shall perform a deflection test on 100% of all pipelines installed under this Contract. **CONTRACTOR** shall provide rigid ball or mandrel deflection testing equipment and labor. **CONTRACTOR** shall obtain approval of equipment and acceptance of method proposed for use. Test shall be performed without mechanical pulling devices.

Any section of the pipeline which shows deflection in excess of 5 percent of the average inside diameter as per ASTM D3034 shall be removed and replaced.

**ENGINEER** may require **CONTRACTOR** to test PVC pipe after backfill has been in place for 30 days.

After acceptance but prior to the termination of the warranty period, the **OWNER** may test the long term deflection of the pipelines. If the **OWNER** determines that the deflection has exceeded 7-1/2 percent of the average inside diameter, that portion of the pipeline shall be corrected by the **CONTRACTOR** at no cost to **OWNER**.

## **4. Closed Circuit TV Inspection**

**CONTRACTOR** shall video inspect all pipeline interiors of the sewer line. All pipelines shall be cleaned, pressure tested and mandrel tested prior to video inspection. **CONTRACTOR** shall supply **ENGINEER/OWNER** with videos prior to placing new sewer line in service.

The **OWNER** reserves the right to conduct additional visual inspections to the interior of the sewer line using a television camera. Any defects in the pipe or construction methods revealed shall be corrected by the **CONTRACTOR** at no additional cost to the **OWNER**.

### **1.3 Submittals**

- A.** Submit as specified in Section 01330.
- B.** Submit the following for acceptance prior to fabrication:
  - 1.** Pipe and joint details.
  - 2.** Special, fitting, and coupling details.
  - 3.** Laying and installation schedule.
  - 4.** Specifications, data sheets, and affidavits of compliance for protective shop coatings and linings.
  - 5.** Manufacturer's design calculations.
- C. Certificates and Affidavits:** Furnish the following prior to shipment:
  - 1.** Affidavit of compliance with applicable standard.
  - 2.** Certificate of origin for all steel flanges. Flanges shall be manufactured in the U.S.A.
  - 3.** Test certificates.

### **1.4 Product Delivery, Storage and Handling**

Protect all pipe during unloading, storage and placement against impact shocks and free falls. Replace damaged or defective materials.

### **1.5 Job Conditions**

Maintain the condition and operation of existing sewer system. Reroute the existing flows if required with the appropriate equipment. Costs associated with maintaining the condition and operation of the existing

sewer system shall be borne by the **CONTRACTOR** at no additional cost to the **OWNER**.

## **PART 2 - MATERIALS**

### **2.1 Pipe Requirements**

- A.** Furnish pipe of materials, joint types, sizes and strength classes as indicated or specified. Higher strength pipe may be furnished at **CONTRACTOR**'s option. Furnish maximum pipe lengths produced by the manufacturer.
- B.** Pipe shall be designed to withstand all stresses resulting from external loads and internal pressures listed in the following table plus applicable allowance for surge unless otherwise specified.
- C.** Pipe bedding as specified and as indicated.
- D. Pipe Marking**
  - 1.** All pipe, fittings and specials shall be marked conforming to the applicable standard specification under which the pipe is manufactured and as otherwise specified.
  - 2.** Mark field location of fittings and specials by line number and station.
- E. Coating for Ductile Iron Pipe**
  - 1.** All pipe for buried service shall be encased in polyethylene pipe wrap in accordance with AWWA C105.
  - 2.** All pipe for exposed service shall be coated in accordance with Section 9900-Protective Coatings.

### **2.2 Polyvinyl Chloride (PVC) Gravity Sewer Pipe**

- A. Design and Manufacture of Pipe and Fittings**
  - 1. Pipe and fittings**
    - a.** Pipe and fittings for 4-inch through 15-inch shall conform to requirements of ASTM D3034 SDR 35, and to ASTM F679- PS 46 for 18 inch through 27 inch

nominal pipe sizes. The pipe shall be made of PVC plastic having cell classification of 12454-B or 12454-C as defined in ASTM D1784.

## **2. Joints**

- a.** Push on joints shall conform to ASTM D3212 and gaskets to ASTM F477. Solvent cements for joining pipe and socket-type fittings shall conform to ASTM D2564.

## **3. Fittings**

- a.** Tee or wye connection suitable for assembly to 4-inch house or building sewers shall be one of the following types:
  - i.** Reducing-branch tee or wye fitting with elastomeric-gasket joints same as pipe. Service line connections shall be bell-end with an elastomeric ring-gasket and a minimum wall thickness of SDR 35.
  - ii.** Saddle-type fittings with an elastomeric ring gasketed bell-end service connection and minimum wall thickness of SDR 35. Saddle-type fitting to be supplied with a rubber sealing gasket and stainless steel straps for connection to pipe.

Furnish permanent plugs for future service line connections and testing.

## **4. Connections**

- a.** Furnish any special flexible couplings required for manhole tie-ins or connections to other rigid structures.

## **B. Service Saddles**

PVC saddle body with neoprene pressure seal. ASTM D3034, SDR 35. Stainless steel straps and bands.

## **2.3 Polyvinyl Chloride (PVC) Pressure Sewer Pipe**

### **A. Design and Manufacture of Pipe**

1. Pipe shall conform to requirements of ASTM D2241 (pressure-rated pipe, SDR 26) for 3-1/2 inch and smaller nominal pipe sizes. The pipe shall be made of PVC plastic having a cell classification of 12454-B, 12454-C or 12454-D as defined in ASTM D1784.

### **B. Fittings**

1. Fittings shall conform to the requirements of ASTM D2466.

### **C. Joints**

1. Jointing of pipe and socket-fittings shall be by solvent cements conforming to ASTM D2564.

## **2.4 Ductile Iron Pipe**

### **A. Design and Manufacturer of Pipe**

1. Pipe shall conform to requirements of AWWA C-151. The pipe shall be rated at the minimum standard pressure rating for the pipe size indicated. The pipe shall be cement mortar lined and seal coated for potable water in accordance with AWWA C-104.

### **B. Fittings**

1. Fittings for push-on joints and mechanical joint pipe shall conform the AWWA C-110 cement mortar lined and seal coated for potable water in accordance with AWWA C-104.
2. Fittings for flanged pipe shall conform to AWWA C-115. Ductile Iron Pipe used for threaded flanges shall be thickness Class 53 minimum.
3. Flange bolts and gaskets shall conform to AWWA C-115, Appendix A.

## **C. Polyethylene Pipe Wrap**

Encase all pipe, fittings and appurtenances with polyethylene film in accordance with AWWA C105, Method A, Class C (Black). Place polywrap on each section of pipe prior to joining. Cut polyethylene tube 2 feet longer than length of pipe. Fold back excess over top of pipe and secure with tape at quarter points along the length of the pipe. Secure to previous section with 360 degree tape wrap.

Adhesive tape shall be approximately 2 inches wide, plastic backed and capable of bonding securely to metal surfaces and/or polyethylene material. Acceptable manufacturers include Polyken No. 900, Scotchrap No. 50, or **ENGINEER**-approved equal.

### **2.5 Polyethylene Pipe**

- A.** Polyethylene pipe for package grinder pump stations to service as force mains shall be of the size indicated and shall conform to ASTM D2239 SDR7 and have a pressure rating of 200 psi.

### **2.6 Sleeves and Couplings**

#### **A. Sleeves**

##### **1. Couplings:**

- a.** Pipe end space shall not exceed one-third of the sleeve laying length.
  - b.** Interior, exposed, exterior, or buried service as indicated.
- 2.** Couplings for service lines shall be rubber boot with steel sleeve such as Furnco Coupling or approved equal.
  - 3.** Couplings for Ductile Iron Pipe shall be Solid Sleeve Couplings with mechanical joint ends conforming to AWWA C-111.



## **PART 3 - EXECUTION**

### **3.1 Preliminary Investigation of the Work**

Verify that all preliminary work has been performed and that the sewer main has been tested and accepted prior to installation and connection of house service lines.

### **3.2 Polyethylene Pipe Wrap**

Encase all pipe, fittings and appurtenances with polyethylene film in accordance with AWWA C105, Method A, Class C (Black). Place polywrap on each section of pipe prior to joining. Cut polyethylene tube 2 feet longer than length of pipe. Fold back excess over top of pipe and secure with tape at quarter points along the length of the pipe. Secure to previous section with 360 degree tape wrap.

### **3.3 Installation**

In accordance with SECTION 02535 - PIPE INSTALLATION

## **PART 4 – SEPTIC TANK AND LATERAL FIELD CLOSURE:**

### **4.1 Septic Tank Closure:**

Upon completion of the connection of the house sewer line to the new sewer, the **CONTRACTOR** shall commence with the closure of the existing septic tank system.

Pump out the septic tank utilizing a pump truck for disposal offsite, thoroughly rinse and clean the tank and pump out second time. Haul and dump septage to the Mohave County Landfill, or other sites, as approved by the **ENGINEER/OWNER**. The rinse water shall be pumped to an active approved sewer through a cleanout approved by the **ENGINEER**. The septic tank lid may be broken into pieces no larger than 8" in any dimension which can be used as backfill in the existing septic tank cavity.

Rinse the inside of the septic tank with a chorine-based disinfectant in a 12 percent solution after final flushing. Fill the remaining portions of the tank with ¾-inch minus materials and compact to 90% density to assure that settlement will not occur. Backfill the yard area and completely restore the yard to its original condition as evidenced by the preconstruction photographs. The **CONTRACTOR** will be charged for the dumping of septic waste at the current rate charged for dumping. The location for dumping of waste shall be the Mohave County Landfill, or other sites, as approved by the **ENGINEER/OWNER**.

## **PART 5 - MEASUREMENT AND PAYMENT**

### **5.1 Measurement and Payment**

- A. Measurement and payment will be made in accordance with Section 1210 - Measurement and Payment.

**\*\*END OF SECTION\*\***