

SECTION 02720

LATERAL INSTALLATION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Installation of laterals and cleanouts.

1.02 QUALITY ASSURANCE

- A. Piping and specials specified herein shall be essentially the standard products of manufacturers who have been regularly engaged in the successful production of high quality materials of this type for at least ten years, have supplied such materials for at least five years of the ten year period, and have at least five installations in successful operation for at least five years.
- B. Repair or replace defective piping or specials.
- C. Lateral Acceptance Tests.
 - 1. General:
 - a. Laterals will be tested for leakage between test tees after lateral installation has been completed. The allowable leakage rate will be zero.
 - b. All laterals be inspected prior to air testing, and all visible or detectable leaks shall be repaired before testing begins. The line acceptance tests shall be made after backfilling has been completed.
 - c. The DEVELOPER shall repair all visible or detectable leaks or defects of any nature to the satisfaction of the ENGINEER, even if the allowable leakage rates are not exceeded.
 - 2. Testing Equipment:
 - a. Air Testing:
 - 1. Air testing shall be performed utilizing testing equipment consisting of an air-compressor and storage tank of adequate capacity; an air control panel equipped with all necessary piping, valves and pressure gages to control the rate at which the air flows to the test section and to monitor the air pressure inside the test section; and all required plugs. In order to prevent overloading the test section with the full pressure of the compressor, the test equipment must be provided with an approved pressure relief device set to blow out at 10 psi. An extra pressure gage of known accuracy shall also be provided so that the gages of the test equipment can be frequently checked. The air testing equipment and all accessories shall be subject to the approval of the ENGINEER.
 - 3. Cleaning

- a. No debris, silt, or other material shall enter the lateral. It shall be the responsibility of DEVELOPER to have the pipe clean at the time of air testing. If required, the pipe shall be cleaned by hydro-flushing with water or be passing through the pipe a full gauge squeegee in a manner approved by ENGINEER.
- 4. Air Testing Procedure:
 - a. Immediately following the pipe cleaning, the pipe installation between the test tees shall be tested with low pressure air at 3.5 psi in excess of the groundwater pressure above the top of the sewer. At least two minutes shall be allowed for temperature stabilization, adding only the amount of air required to maintain pressure.
 - b. The pipe shall hold the required test pressure for the duration prescribed in the air test table in Section 02722.
 - c. Repair and retest sections of lateral not meeting test requirements.
- D. Minimum Testing Requirements.
 - 1. DEVELOPER shall take care to securely fasten and brace all line plugs in the pipe section being tested so that none of the plugs is suddenly released when the compressed air is applied to the pipe section. DEVELOPER shall limit the internal pressure in the sewer line to 5 psi greater than the average back pressure of any ground water that may submerge the pipe.
 - 2. DEVELOPER shall be responsible for any damages caused by the internal pressurizing of the sewer line.
 - 3. All gages, air piping manifolds and valves of the air testing equipment shall be located above ground at the top of the trench.
 - 4. Special care shall be exercised during removal of plugs; and the pressure in the piping of the test section shall be completely relieved before any plug shall be removed.

1.03 SUBMITTALS

- A. Submit shop drawings or catalogue cuts, as appropriate, for materials listed under Article 2.01 of this Section. Submit only those materials that are actually to be used in the work. These will usually be as follows:
 - 1. Pipe.
 - 2. Fittings.
 - 3. Gaskets, Couplings, Adapters, and Other Appurtenances.
- B. Make submittals prior to start of construction. Make submittals to ENGINEER.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle the piping, manholes, manhole frames and covers and appurtenances in accordance with the manufacturer's recommendations, and in such manner as to protect the materials from damage.
- B. Pipe and related materials shall be loaded and unloaded by lifting with hoists or

skidding so as to avoid shock or damage. Under no circumstances shall such material be dropped or skidded against pipe already on the ground.

- C. Pipe and related materials shall at all times be handled with care to avoid damage. The interior shall be kept free from dirt and foreign matter. All pipe, manholes, manhole frames and covers and appurtenances shall be carefully lowered or raised into place with suitable equipment in a manner that will prevent damage to the material. Under no circumstances shall pipe or accessories be dropped or dumped.
- D. All lumps, blisters, and excess coating shall be removed from the ends of each pipe. The joints shall be wire brushed and wiped clean, dry and free from oil and grease before the pipe is installed.

PART 2 PRODUCTS

2.01 MATERIALS

- A. PVC Pipe - 4" and 6" Diameter.
 - 1. Pipe and Fittings.
 - e. Unplasticized polyvinyl chloride (PVC) gravity sewer pipe and fittings with integral wall bell and spigot joints meeting ASTM D-3034 specification for Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings, Standard Dimension Ratio (SDR) 35, ASTM F789; or ASTM D-1785 Schedule 40 (Type 1, Grade 1) with socket joints and fittings suitable for solvent welding.
 - f. The SDR 35 pipe shall be joined with an integral bell, bell-and-spigot type rubber gasketed joint. Rubber gasket shall conform to ASTM F 477. The rubber gasket shall be compressed radially on the pipe spigot to form a watertight seal in accordance with ASTM D 3212. Schedule 40 pipe and fittings shall be joined by solvent welded socket joints in accordance with ASTM D-2855.
 - g. Fittings shall be made of PVC having a cell classification of 12454B or 12454C, as defined in ASTM D 1784.
 - h. As applicable for SDR 35, pipe stiffness at 5% deflection shall be 46 psi for all pipe diameters when tested in accordance with ASTM D 2412.
 - 2. PVC Saddles: Provide tee saddles with skirts correctly contoured for outside diameter of pipe, and incorporating ring gasket bell outlet and gasketed skirt. Saddles to be commercially manufactured molded units conforming to design requirements of ASTM D 3034 Type SDR-35, made from PVC compounds having a cell classification of 112454-B, 12454-C, or 13343-C as defined in ASTM D 1784.
 - a. Outlet Joint: Push-on style with elastomeric gasket, conforming to ASTM D 3212 for outlet joint design.
 - b. Gaskets: Both pipe outlet gasket and saddle skirt gasket shall conform to

ASTM F 477 requirements for material specifications, providing a watertight seal.

- c. Skirt Bands: Saddle skirts provided with two pre-assembled type 305 stainless steel band and clamp assemblies.

B. Cast Iron Pipe - 4" and 6" Diameters.

1. Pipe and Fittings.

- i. Cast iron gravity sewer pipe and fittings of either "Service Weight" or "Extra Heavy" with integral wall bell and spigot joints meeting ASTM A-74 specification for cast iron gravity sewer pipe and fittings.
- j. Pipe shall be joined with an integral bell, bell and spigot type rubber gasket joint conforming to ASTM C-564. Rubber gasket shall be compressed radially on the pipe spigot to form a water tight seal.
- k. Fittings shall be made of either Service Weight or Extra Heavy cast iron and shall be of the bell and spigot type having a rubber gasket which meets ASTM A-74 and create a water tight seal.

C. Compression-Fit PVC Hub: Provide Compression-Fit PVC Hubs (Inserta Tee) only for service connections into Closed Profile PVC Pipe. Materials and construction as follows:

1. PVC Hub: Manufactured from polyvinyl chloride (PVC) pipe, Type PSM SDR-35, conforming to ASTM D 3034 requirements. The hub shall conform to ASTM D 3212 requirements for push-on style pipe joint with elastomeric gasket; gasket conforming to ASTM F 477 requirements for material specifications, providing a watertight seal.
2. Band-Screw Assembly: Stainless steel band and housing fabricated from type 301 stainless steel; tightening screw of type 305 stainless steel.
3. Rubber Sleeve: A molded component of materials composition meeting the requirements of ASTM C 443.
4. Acceptable Manufacturers:
 - a. Fowler Manufacturing Company; Inserta Tee.
 - b. Or equal.

D. Rigid Pipe Couplings

1. SDR 35 PVC in-line rigid pipe couplings, with rubber gaskets; or Schedule 40 (ASTM D-1785).
2. Fittings manufactured in accordance with ASTM number D-3034 and D-1784 or ASTM D-1785 and D-1784.
3. Rubber gaskets for fittings shall conform to ASTM designation F477.
4. Approved manufacturers.
 - a. GPK Products, Inc., Fargo, ND.
 - b. Approved equals.

E. Flexible Pipe Adaptors.

1. Flexible rubber with stainless steel band clamps.

2. Constructed from materials which will pass the strength and chemical requirements of ASTM C-954.
 3. All banded adaptors shall bear the manufacturer's identifying mark and size.
 4. Approved manufacturers.
 - a. Fernco, Davidson, MI.
 - b. Mission, Corona, CA.
 - c. Calder, Gardner, CA.
- F. Pipe Plugs: Designed for permanent installation and removable. Obtain plugs for various types of pipe used from the respective pipe manufacturer.
- G. Cleanouts
1. Construction will be as directed by the ENGINEER.
 2. Test tees will be installed at the direction of the Authority's personnel
 3. Cleanouts to be installed at all changes in vertical and horizontal directions.

PART 3 EXECUTION

3.01 LAYING PIPE

- A. Following trench excavation, pipe laying shall proceed upgrade with pipe laid carefully, hubs upgrade, spigot ends fully centered into adjacent hubs, and true to lines and grades given. Provide test tees as indicated on Detail No. 92 Service Connection Shallow Sewer or Detail No. 93 Service Connection Deep Sewer.
1. Tees: Make connections to sewer using tee fittings of same material and joint configuration as the sewer at planned point of branch connection.
 - a. Use commercially manufactured wye or tee fittings and one-eighth bends.
 - b. Set tee branches at proper vertical angles as required to bring service connections to the proper depth.
- B. Each section of pipe shall rest upon the pipe bed for the full length of its barrel, with recesses excavated to accommodate bells and joints. Each pipe shall be firmly held in position so that the invert forms a continuous grade with the invert of the pipe previously placed.
1. Lateral pipe having an inside diameter of 4" shall be laid at a grade not less than $\frac{1}{4}$ " per ft.
 2. Lateral pipe having an inside diameter of 6" shall be laid at a grade not less than $\frac{1}{8}$ " per ft.
- C. Under no conditions shall pipe be laid in water, on subgrade containing frost, and/or when trench conditions are unsuitable for such work. In all cases, water shall be kept out of the trench until concrete cradles, supports, encasement, or saddles, where used, and materials in the joints have hardened.
- D. Any pipe that has its grade or joint disturbed after laying shall be taken up and relaid. Any section of pipe already laid and found to be defective shall be taken up and

replaced with new pipe.

- E. Walking or working on top of the completed pipeline, except as may be necessary in backfilling or tamping, shall not be permitted until the trench has been backfilled to a height of at least 2 feet over the top of the pipeline when using a mechanical tamper and at least 4 feet using a hydrohammer.
- F. Maintain pipelines free and clear of debris during the progress of the work.
- G. At times when pipelaying is not in progress, the open ends of the pipe shall be closed by watertight plug.
- H. Inspect pipe and fittings for defects or damage prior to lowering into the trench.
- I. Install PVC pipe and fittings in accordance with manufacturer's written instructions.
- J. Use of hydrohammer for compaction will not be permitted within a minimum of four (4) feet of the top of the pipe.
- K. Install pipe couplings and adapters in accordance with the manufacturer's written instructions.

3.02 CONNECTION OF NEW LATERAL TO EXISTING SEWER MAIN

- A. Connection of the lateral to the mainline sewer shall be made by removing a section of the mainline sewer and replacing it with an SDR 35 PVC wye branch connection or sanitary tee and then reconnecting this to the mainline with rigid PVC gasketed couplings. In the event a rigid coupling is not available for the pipe sizes and materials being joined, flexible rubber adaptors with stainless steel bands may be used. Any other type of connection to the sanitary sewer (i.e. saddles) must have prior approval from the Authority or Authority Engineer, and be installed in accordance with and Authority approved procedure.
- B. Test tees for air testing the building sewer shall be installed adjacent to the connection between the building sewer and the service lateral or the right-of-way line, whichever is appropriate.
- C. All sanitary sewer laterals shall pass an air test before they may be accepted by the Authority.

3.03 CLEANOUTS

- A. Building sewers.
 - 1. All building sewers shall have cleanouts located not more than 100 feet apart.
- B. Changes in direction.
 - 1. Cleanouts shall be installed at each change of direction of the building drain or of

horizontal waste or soil line, which is greater than 45 degrees. Where more than one change of direction occurs in a run of piping, only one cleanout shall be required for each 40 feet of developed length of the drainage piping. Access shall be provided to all cleanouts.

3.04 CLEANING

- A. No debris, silt, or other material shall be allowed in the lateral. If required, the pipe shall be cleaned by hydro-flushing with water or by passing through the pipe a full gauge squeegee in a manner approved by the Authority.

3.05 AIR TESTING

- A. Air testing shall be performed utilizing testing equipment consisting of an air-compressor and storage tank of adequate capacity; an air control panel equipped with all necessary piping, valves and pressure gages to control the rate at which the air flows to the test section and to monitor the air pressure inside the test section; and all required plugs. The pressure gauge for measuring internal pipe pressure must be an oil filled gauge measuring from zero to twenty psi, in one pound increments. In order to prevent overloading the test section with the full pressure of the compressor, the test equipment must be provided with an approved pressure relief device set to blow out at 10 psi. An extra pressure gage of known accuracy shall also be provided so that the gages of the test equipment can be frequently checked. The air testing equipment and all accessories shall be subject to the approval of ENGINEER.

- B. Immediately following the pipe cleaning, the pipe installation between the test tees shall be tested with low pressure air at 3.5 psi in excess of the groundwater pressure above the top of the lateral. (Pressure should not exceed 5 psi above the groundwater pressure.) At

least two minutes shall be allowed for temperature stabilization, adding only the amount of air required to maintain pressure.

- C. The pipe shall hold the required test pressure for 1 minute 53 seconds for 4" pipe (lengths less than 597') and 2 minutes 50 seconds (lengths less than 398').
- D. Repair and retest sections of lateral not meeting test requirements.

END OF SECTION

