

SECTION V. SANITARY SEWERS

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A. GENERAL REQUIREMENTS

- 1. Standards And Specifications:** Sewer system design and layout shall meet all standards and specifications of the Division of Water Quality. Where the State specifications conflict with the City specifications, the most stringent specifications shall take precedence. See the City Standard Construction Drawings.
- 2. Gravity Operation:** Unless unfeasible, the system shall be designed so that the system operates by gravity means only. Sewage lift stations and force mains may be used only with the approval of the City.
- 3. Depth of Mains:** Sewer mains shall be designed to run at minimum slope to maximize the area both inside and outside the development served by that sewer at a depth to allow gravity service to the basement finished floor elevation of all buildings within the development and to all future extensions of the development where sewer will be required.
- 4. Diameter of Mains:** Diameter of sewer mains shall be a minimum of eight inches (8").
- 5. Clean-Outs:** Clean-outs in sewer mains are not permitted. Clean-outs are required on laterals as shown on the City standard construction drawings.
- 6. Inspections:** Inspections will be done as per Providence City Standards, see Section II G-2-a.
- 7. As-Built Drawings:** Two (2) copies, in addition to one reproducible copy of the as-built drawings, including all approved changes, shall be provided by the developer to the City prior to the minimum improvement inspection and before asphalt is laid.

B. POLY-VINYLCHLORIDE (PVC) SEWER PIPE

- 1. General:** Sewer pipe shall be ASTM C-14 Class 3, D-3034 (SDR 35) type PSP poly (vinylchloride) (PVC) sewer pipe and fittings.
 - a.** This specification covers requirements for PVC pipe and fittings to be furnished for sanitary sewer.
 - b.** Pipe and fittings produced to the standards below should be installed in accordance with manufacturer's specifications.

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C. SEWER APPURTENANCES & TESTING, FLUSHING and VISUAL IMAGING

1. Test For Leaks: All sewer lines shall be pressure tested to four (4) psi. for 10 minutes.

2. Flushing: Flushing of all new sewer manholes, mains and laterals is required immediately prior to visual imaging at no expense to the City and may be required again prior to final inspection.

a. In no case shall work be accepted where infiltration is in excess of the rate one hundred (100) gallons per day per mile of sewer per inch of pipe diameter, for any section or portion of the line.

b. Testing for leaks, flushing and visual imaging is due no more than two (2) weeks after the sewer installation is complete.

3. Connections To The Main: Connections to the main for building connections shall be four or six inches (4" or 6") in diameter, and shall be installed in the sewer at such locations as may be directed by the City. Connections to the main shall be elevated so that the flow line of the connection is level with the center line of the pipe. Each connection, not used in connecting present laterals, shall be sealed by means of a suitable plug.

4. Manholes: Manholes shall be installed at all changes in grade and alignment and at maximum spacing of four hundred feet (400'). All manholes shall be set in location and elevation to a grade stake specifically set for that purpose at a minimum of five feet (5') off the lip of the curb.

a. General: This item shall consist of the construction or installation of concrete manholes of the various types and diameters shown on the plans and at the designated locations. The item shall include: ring and cover, steps and all other incidentals necessary to fully complete the manholes.

b. Precast Manholes: Precast manholes shall consist of sections of rings of tongue and grooved reinforced concrete pipe on a cast in place foundation. Both circular and conical sections shall meet the requirements of "Reinforced Concrete Sewer Pipe (ASTM Specifications C75-76)".

i. Approved eccentric manholes with rungs will be accepted. Concentric manholes will not be accepted.

ii. Joints between sections shall be set in: 1) cement grout; or 2) asphaltic sewer joint compound. Joints shall be watertight.

c. Cast in place base sections shall be recessed on the bottom edge to receive the pipe entering the manhole. The base section shall extend at least two inches (2")

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into the concrete of the floor. When practical, the base section shall be set in position before the floor is poured; in any case the base section shall be imbedded in the floor before the concrete has taken its initial set.

d. Manhole Covers: The contractor will furnish and install the cast iron frame and cover shown on the plans as a part of the manhole.

e. Castings, Quality Of Metal: All castings shall be made of good quality cast iron, strong, tough, straight grained and free from flaws, cracks, blow holes or other defects and of exact form and dimensions shown on the plans. They shall be evenly and firmly set and imbedded as not to afford the chance of any movement. The seats and bearings of all frames and covers shall be machine faced and it shall fit evenly and firmly and so made as to be interchangeable. Iron shall conform to "Standard Specifications for Gray Iron Castings" ASTM Specification A 48-48 or Class 30.

f. Grade and Line: The developer's engineer shall set a grade stake for each manhole indicating its location, flow line cut, and finish grade elevation to the top of the manhole cover. Once set, manholes shall not be disturbed during construction. The contractor shall make all final grade adjustments necessary to bring the cover to the finished street grade as shown on the approved construction drawings and the City standard detail. Where required by the street centerline grade, grade rings shall be used so the manhole cover is flush with the finish surface. Lines entering penetrations shall have deflection of no greater than five degrees (5°).

g. Manhole Ladders: Per City Standard Construction Drawing.

h. Split Pipe And Stubs In Manholes: The contractor will be required to furnish and place, where plans may require, split pipe in the bottom of the manhole and inlets of the size and shape shown on the plans. The inlets, when required shall be fitted with a cap of the same description as specified for wye branches.

i. Revisions To Existing Manholes: All work required to revise or modify existing manholes, as shown on the plans necessary to complete the project shall be done by the contractor and no extra compensation shall be allowed for this work. This work shall include such incidentals as raising manhole floors, providing drop type inverts, new invert openings, etc.

j. Connections To Existing Manholes: No entrance of personnel into any manhole shall be allowed by any person or agent without complying totally with the safety procedures of the Confined Space Ruling. No entrance to any manhole shall be allowed without permission from the City. No sewer line may be connected to a manhole without permission from the City and a City inspector being present. When extending a sewer main or line into an existing manhole, provisions shall be

provided to prevent any foreign material, cement chips, gravel and etc., from entering into the existing sewer line.

k. Camera Inspection Of Lines: Before the City will accept any sewer pipe construction work, the entire sewer main pipe and all service lateral connections shall be visually imaged and recorded by the developer with a remote camera system specifically designed for such purposes. A recorded DVD shall be clearly labeled designating the name of the project, the date of said visual imaging and the sequence of manhole identification numbers (or other clear means of identification) along the travel path of the camera. All recorded imaging shall be submitted to the City for approval. In the event that any imaging is not viewable or if substandard material or workmanship is found, that material shall be removed at the developer's expense and new materials installed that meet the required City standards. All sections reinstalled shall be visually imaged and submitted to the City for approval.

Camera equipment used to supply visual imaging of sewer lines shall be self propelled, (no push rod cameras will be accepted). The camera shall be self leveling and equipped with the ability to pan side to side to show lateral connections.

4. Sewer Service Laterals: The contractor shall be fully responsible for any leaks in sewer laterals, to the same extent as if such leaks were in the sewer main.

5. Workmanship:

a. The contractor or others responsible for the work shall provide adequate means to prevent the entrance of foreign materials into the sewer lines via the manholes.