

CHAPTER 3.07 STORM SEWER PIPING.

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3.07.005 GENERAL. This Chapter covers the requirements for pipe materials and installation of Concrete and Corrugated metal Pipe.

3.07.010 PIPE MATERIALS.

A. Reinforced Concrete Pipe. All reinforced concrete pipe used in the construction shall be of the rubber gasket type, bell and spigot joint design, conforming to the requirements of the latest revision of ASTM Designation C-76. Pipe class shall be as shown on the approved drawings. If pipe class is not shown, Class III pipe shall be used. The minimum joint length of all pipe provided shall be seven and one-half (7½) feet, or as approved by the City Engineer.

B. Non-Reinforced Concrete Pipe. All non-reinforced concrete pipe shall be of the rubber gasket type bell and spigot joint design conforming to the latest revision of ASTM designation C-14, Class 3.

C. Bell and Spigot Joints. Bell and spigot joints, including rubber gaskets, shall conform to the requirements of the latest revision of ASTM Designation C-443. The pipe joint shall be so designed as to provide for self-centering, and when assembled, to compress the gasket to form a watertight seal. The gasket shall be confined in a groove on the spigot, so that pipe movement or hydrostatic pressure cannot displace the gasket.

D. Corrugated High Density Polyethylene Pipe (CHDPEP). CHDPEP shall conform to AASHTO -252 three (3) to ten (10) inches, AASHTO -294 twelve (12) to forty eight (48) inches, ASTM F-405, ASTM F-667, and shall be Type S (Smooth Interior). All CHDPEP used in the construction shall be of the rubber gasket type, bell and spigot joint design, conforming to the requirements of the latest revision of ASTM D-3212 and ASTM F-477 (Elastomeric Gaskets). Minimum Cover shall be twenty four (24) inches unless otherwise determined by City Engineer. Maximum Cover to be determined by City Engineer.

3.07.015 PIPE LAYING. All pipe installation shall proceed upgrade on a stable foundation, with joints closely and accurately fitted. Rubber gaskets shall be fitted properly in place, and care shall be taken in joining the pipe units to avoid twisting of gaskets. Joints shall be clean and dry, and a joint lubricant as recommended by the pipe supplier shall be applied uniformly to the mating joint surfaces to facilitate easy positive joint closure.

A. Pipe shall be installed with uniform bearing under the full length of the barrel, with suitable excavations being made to receive pipe bells. Select material shall be compacted around the pipe to firmly bed the pipe in position. If adjustment of position of a pipe length is required after being laid, it shall be removed and rejointed as for a new pipe. When laying is not in progress, the ends of the pipe shall be closed with a tight-fitting stopper to prevent the entrance of foreign material.

B. In addition to the above requirements, all pipe installation shall comply with the specific requirements of the

pipe manufacturer.

3.07.020 GRAVEL FOUNDATION FOR PIPE. Wherever the sub grade material does not afford a sufficiently solid foundation to support the pipe and superimposed load, and where groundwater must be drained, the sub grade shall be excavated to such depth as may be necessary and replaced with crushed rock or gravel compacted into place.

A. Gravel for concrete pipe foundation shall be clean crushed rock or gravel with one hundred (100) percent passing a one and one half (1½) inch screen and five (5) percent passing a No. 4 sieve.

3.07.025 INSTALLATION REQUIREMENTS FOR LINE AND GRADE. All concrete and CHDPE pipe shall be installed accurately to the defined line and grade with the following limits:

A. Variance from established line and grade shall not be greater than one-sixteenth (1/16) inch per inch of pipe diameter in ten (10) feet, and not to exceed one-half (½) inch in ten (10) feet, provided that such variation does not result in a level or reverse sloping invert; provided also that variation in the invert elevation between adjoining ends of pipe, due to non-concentricity of joining surface and pipe interior surfaces, does not exceed one sixty-fourth (1/64) inch per inch of pipe diameter, or one-half (½) inch maximum.

3.07.030 PIPE BEDDING. All pipe sewers and drains shall be protected from lateral displacement and possible damage resulting from impact or unbalanced loading during backfilling operations by being adequately bedded.

A. A groove shall be excavated in the bottom of the trench to receive the bottom quadrant of the pipe. Before preparing the groove, the trench bottom shall be excavated or filled and compacted to an elevation sufficiently above the grade of the pipe so that, when completed, the pipe will be true to line and grade. Bell holes shall be excavated so that only the barrel of the pipe receives bearing from the trench bottom.

B. Pipe bedding materials placed at any point below the mid-point of the pipe shall be deposited and compacted in layers not to exceed ten (10) inches in uncompacted depth. Deposition and compaction of bedding materials shall be done simultaneously and uniformly on both sides of the pipe. Compaction shall be accomplished with hand or mechanical compactors. All bedding materials shall be placed in the trench with hand tools or other approved method in such a manner that they will be scattered alongside the pipe and not dropped into the trench in compact masses. Bedding materials shall be loose earth, free from lumps; sand or gravel, free from rocks larger than two-inch diameter; with all materials free from roots, sod, or other vegetable matter.

C. In the event trench materials are not satisfactory for pipe bedding, modified bedding will be required. Modified bedding shall consist of placing compacted granular material on each side of and to the level of twelve (12) inches above the top of the pipe.

D. Modified bedding material shall be graded as follows: one hundred (100) percent passing a one and one-half (1½) inch screen and five (5) percent passing a No. 4 sieve.

3.07.035 BACK FILL OF CORRUGATED HIGH DENSITY POLYETHYLENE PIPE (CHDPEP). Backfill of CHDPEP shall be done in accordance to the Manufactures specifications.

3.07.040 TESTS. The Contractor will be required to conduct a displacement test in the presence of the City Engineer or his representative. Test shall be performed as follows:

A. Displacement Test. In conducting the displacement test a light will be flashed between manholes or, if the manholes have not as yet been constructed, between the locations of the manholes by means of a flashlight or by reflecting sunlight with a mirror. If the illuminated interior of the pipe shows broken, misaligned, or displaced pipe or other defects, the defects designated by the City Engineer shall be remedied at the Contractor's expense. If a curved pipeline is approved and installed, or if displacement or breakage is suspected and is not readily visible, the City Engineer may require television inspection of the curved pipeline or the suspect section of the pipe.