

PART VI - SANITARY SEWER SYSTEM DESIGN CRITERIA (Public & Private)

A. Size Criteria

1. Definitions
 - a The main is that portion of the sewer system between manholes, or between manhole and the end of the main line provided with a lamphole.
 - b A lateral is that portion of the sewer system which is connected to the main and which serves one parcel or building.
2. The gravity sewer main lines shall be a minimum of eight inch (8") in diameter except that dead end lines of less than 300 feet can be 6 inches in diameter. Laterals shall be a minimum of 4" in diameter for single family residences and 6" for commercial, duplex and multi-family lots.
3. Laterals shall be placed at least 3' below top of curb grade elevation with 2% minimum slope and with a cleanout 6" from property line on private property (at the right-of-way or easement line).
4. 6", 8", and 10" main lines shall have a minimum slope of 0.3%; 12", 14" and 15" main lines shall have a minimum slope of 0.2%; slopes to be adjusted to account for partial flow to maintain the minimum velocity.
5. For gravity flow, use the Manning formula with a minimum design velocity shall be 2 fps for the design flow, and with a design "n" factor of 0.013.
6. Lampholes are acceptable at the end of line if the distance is not more than 100' to the downstream manhole.
7. Design flows to be submitted to City for approval. (see Attachment "L" for the sewage generation worksheet).
8. Each lateral must have an approved cleanout. Only one lateral is allowed per parcel.

B. Alignment

1. Under normal conditions, sewers should be located in street right-of-way five feet south or west of the street right-of-way centerline. When it is necessary to locate sewers in easements, such easement shall be at least fifteen feet in width. Sewers 24 inches in diameter or larger, or over twelve feet in depth, may require wider easements.
2. Conduits 24 inches or less in diameter should be laid on straight alignment and uniform grade between consecutive manholes.

3. Horizontal and vertical curves are not recommended. However, in cases where justification can be shown, limited use of such designs will be considered. A design report or letter report will be required from the design engineer to document the justifications for utilizing a curved alignment.
4. Radii of curvature must be of sufficient length to limit deflections to $\frac{1}{2}$ the manufacturer's recommended allowable deflection. Complete and accurate details shall be furnished, including: exact location of such curved sewers, length of curve, degree of curve (or radius) and stationing of curve points.
5. Where curved alignments are utilized, the City may require the following:
 - a Slope greater than minimum slope for the size of pipe.
 - b Manhole spacing of less than 300 feet.
 - c Provide a licensed professional land surveyor or engineer to continuously monitor installation of the curved pipe during construction.
 - d Video inspection curved pipes prior to final acceptance.
6. The following are common locations required for manholes:
 - a Where two or more sewer mains join,
 - b At intermediate points on long pipe runs, maximum spacing of 300 feet,
 - c Where the conduit changes in size,
 - d At sharp curves or angle points in excess of 10 degrees, and
 - e Points where an abrupt change of the grade occurs.
7. Horizontal clearances between water lines and sewer lines shall be 10 feet or unless otherwise approved by the City Engineer. Clearances between all other utilities shall be 5 feet.
8. Minimum vertical clearance from other utilities shall be one foot; and sewers must clear underneath water lines.
9. Minimum horizontal clearance from any structure shall be based on the criteria of keeping the bottom of the trench clear of the "1 to 1" plane from the bottom of the structural footing (Attachment "F").
10. No sewer laterals shall be connected to manholes.
11. Minimum cover over gravity sewers and force mains shall be three (3) feet.

C. Materials

1. Materials for sanitary sewers shall be PVC conforming to the City's Standard Technical Specifications.
2. Sanitary sewers will be required to pass a low pressure air test or water test prior to acceptance.

D. Maintenance Requirements

1. The City will maintain sanitary sewers in public streets, private streets, and easements up to the cleanout.
2. Property owners must maintain the cleanout and the pipe beyond the cleanout.