Section XIII

PRESSURE SEWER (FORCE MAIN)

DESIGN GUIDELINES

A. GENERAL

1. The following pressure sewer system design guidelines are based on Federal, State and local health requirements and the Hilton Head No. 1 Public Service District engineering design criteria.

2. These design guidelines are applicable to all developments including, but not limited to, residential, commercial and industrial developments, subdivisions and/or parks requiring sewer service from the Hilton Head No.1 Public Service District.

3. All design criteria, materials, and construction shall be in accordance with DHEC regulations, AWWA, and ASTM standards.

B. PRESSURE SEWER (FORCE MAIN) DESIGN CRITERIA

1. Force mains carrying raw domestic sewage shall be at least four (4) inches in diameter, except force mains that follow grinder pump systems or solid interceptor tanks, for which a two (2) inch diameter force main is approvable.

2. Velocity in force mains shall be at least two (2) feet per second at design flow. However, lower initial velocities may be permitted by the Department if provisions to maintain a flushing velocity can be made, or if the wastewater does not contain suspended solids.

3. Maximum pipe size:

    a. Provide so as to maintain the minimum 2 feet per second velocity and minimize pump head.

4. Hazen and Williams design coefficient:

    a. PVC: C=140

    b. Ductile iron pipe: C=120

C. AIR RELEASE VALVES

1. Provide at high points in the force main.

2. Design force main to minimize the number of air release valves.

3. Provide at 1000-foot intervals where force main is installed at no slope.

D. PLUG AND CHECK VALVES

1. For force mains greater than 5,000 feet in length, provide a plug valve at the halfway point, or every 4,000 feet.

2. Where a force main is tying into an existing force main:

    a. Provide a plug valve and check valve on the smaller force main.

    b. Locate both valves inside an accessible manhole.

3. See Section XVIII for valve specifications.

E. FORCE MAINS ENTERING MANHOLES

1. Force mains tying onto manholes shall enter the manhole a vertical distance of not more than two (2) feet above the flow line of the receiving manhole. For connections to existing manholes, special consideration may be granted by the Department to allow the force main to enter the manhole at a higher elevation and be directed down on the inside of the manhole, if justified.

F. SEPARATION OF PRESSURE SEWER AND WATER MAINS

1. Where possible, locate pressure sewer at least ten (10) feet away, horizontally, from water mains.

2. Should ten (10) foot separation not be practical, then the pressure sewer may be located closer provided:

    a. It is laid in a separate trench.

    b. It is laid in the same trench with the water main located at one side on a bench of undisturbed earth.

c. In either of the above cases, the sewer pipe must be a minimum of 18” below the water pipe measured outside to outside.

3. Where pressure sewers cross over or under water lines, maintain 18" minimum clearance between outside edges of the two pipes.

    a. Use full length of pressure sewer pipe located so that the joints will be equal distance from the water main.

G. THRUST BLOCK DESIGN

1. Maximum soil pressure: 2000 lbs/sq ft.

2. Minimum water pressure: 150 psi.

H. COVER

1. Provide suitable cover on all pressure sewers. Minimal cover depth as follows:

    a. Less than 8" diameter: 36".

    b. 10" and 12" diameter: 36".

    c. 14" diameter and larger: 48".

2. All piping located within the right-of-way of the South Carolina Department of Transportation shall have a cover as indicated above or 36" below the elevation of the road, whichever is greater.

3. Special conditions other than those listed above may be approved if requested in writing from the Hilton Head No. 1 Public Service District.

I. DUCTILE IRON PIPE LOCATIONS

1. Use ductile iron pipe where a pressure sewer:

    a. Crosses over or under a water line.

    b. Crosses beneath storm drainage pipe with less than three (3) feet of clearance.

c. Crosses above storm drainage pipe with less than two (2) feet of clearance.

d. Crosses creeks, rivers and other water bodies.

e. Installed in casing.

f. Where a valve is installed in the line.

g. Cover is less than the depth prescribed in Part H above.