

SECTION 1.4 - DESIGN PARAMETERS FOR SANITARY SEWERS

**1.04.01 GENERAL**

- A. Where sewer mains are to be installed for a residential or commercial development, the developer is responsible for all improvements. Developers shall hire a contractor approved by the Town of Easton and Easton Utilities, and pay all costs associated with the work. The Developer shall install sewer laterals with cleanouts in the pipe laying process. Connections to the sewer mains shall be made with wye fittings.
- B. Laterals shall be constructed of Schedule 40 PVC. Maintain a minimum of 24-inch cover. Lateral extensions from the cleanout to the house shall conform to County Plumbing Regulations.

**1.04.02 PROJECT DRAWINGS**

**A. TITLE SHEET**

- 1. Title of Project and Address.
- 2. Phase of Project (if necessary).
- 3. Developers' Name and Address.
- 4. Design Engineer's Name and Address.
- 5. Drawing Index.
- 6. Approval Block for Town Engineer's signature and date.
- 7. Vicinity Map showing location of Project within the Town. Typical scale shall be 1 inch equals 1000 feet.
- 8. Location Map if drawings are for one phase of the development.
- 9. Design Engineer's Seal and Signature.
- 10. Certification by the Design Engineer to the accuracy of the drawings.
- 11. Certification by the Developer approving the drawings.
- 12. Design calculations and daily flows with total number of units, lots, etc.
- 13. Certification by a Professional Wetlands Scientist for wetland determination if hydric soils are present.

**B. HORIZONTAL PLAN (SANITARY SEWERS)**

- 1. The scale shall be 1 inch equals 20 feet for small projects up to a maximum of 1 inch equals 50 feet for large projects.
- 2. North Arrow shall be shown.
- 3. The existing and proposed legend.
- 4. All necessary utility notes.
- 5. Location, elevation and description of all the Project Benchmarks referenced to, and using, NAVD 88 monuments.
- 6. Location, sizes, type and slope of all sanitary sewer lines with stations corresponding to the profiles.

7. Location of all manholes with grades between any elevation of flow line, and all invert elevations.
8. Property lines and ownership, with details of easements where required.
9. Location of all existing and proposed structures and buildings with unit numbers.
10. Beginning and end of proposed structures and buildings with unit members.
11. Location of proposed laterals, wyes, etc.
12. Location of all other drainage facilities and public utilities.
13. Proposed manhole numbers and cleanouts and proposed lot numbers.
14. All existing sanitary sewer facilities (i.e. manholes and pipelines) shall be shown and labeled for inverts and size.

**C. PROFILES (SANITARY SEWERS)**

1. The horizontal scale shall be identical to the Horizontal Plan and vertically, one-tenth (1/10) of the horizontal scale.
2. Profile of existing and proposed ground surface.
3. Profile of sanitary sewer showing, type and size of pipe, slope, manholes and concrete encasement (if any). Designate manhole diameters if other than 48 inches.
4. Location of all other drainage facilities and public utilities crossing sanitary sewer lines.

**D. DETAILS (SANITARY SEWERS)**

Standard construction details, as shown in the Standard Detail Section of this Booklet, shall be included on the construction drawings where applicable. Details for construction, other than the Standard Details, shall also be shown on the project drawings.

**1.04.03 DESIGN CAPACITY**

In determining the required size and capacity of the sanitary sewer, the following factors should be considered:

- A. Average and peak hourly domestic sewage flow.
- B. Topography of area.
- C. Depth of excavation.
- D. Pumping requirements if necessary.

The calculations for design of the sanitary sewers shall accompany the Project's Drawings, when submitted for review.

#### **1.04.04 DESIGN FLOW**

##### **A. PER CAPITA FLOW**

The sanitary sewer system shall be designed on the basis of an average daily flow of 300 gallons per day per equivalent dwelling unit.

##### **B. PEAK DESIGN FLOW**

Sanitary sewer shall be designed on a peak flow basis using the ratio of peak to average daily flow as determined from Figure 2.1, the latest edition of the 10-State Standards.

#### **1.04.05 MINIMUM SIZE**

##### **A. SANITARY SEWER MAINS**

The required size of sanitary sewer mains will vary with the character and size of the Development. The minimum size for sanitary sewer main is six (6) inches.

##### **B. LATERAL CONNECTIONS**

Lateral cleanouts are required for use with all laterals.

Each individual dwelling unit and multi-family units, with the exception of structures where each unit may not extend to the ground floor, shall have an individual lateral installed. The minimum diameter of laterals extending from Easton Utilities maintained cleanouts shall be six inches (4") at minimum slope of 2%. Lateral cleanouts shall be placed at the property line and within 5 feet of the foundation. If the lateral is greater than 75 feet in length, additional cleanouts may be required. Cleanouts on private property shall be per the State or County Plumbing Code in effect.

#### **1.04.06 DEPTH OF SEWER**

Minimum depth of PVC sewer mains shall be 42 inches as measured from the top of the pipe to finished grade. Any piping not meeting the required minimum depth shall be ductile iron.

#### **1.04.07 SLOPES**

All sewers shall be designed and constructed to give mean velocities, when flowing full, of not less than 2.0 feet per second, based on Mannings formula. If possible, pipe slopes should be increased above minimum slope in locations where pipes will carry functional flow.

Using an “n” value of 0.010 for PVC, the following are the minimum slopes which are allowed:

<u>Sewer Size</u>	<u>Minimum Slope in Feet Per 100 Feet</u>
8 inch	0.28
10 inch	0.22
12 inch	0.17
15 inch	0.12
18 inch	0.10

Using an “n” value of 0.013 for Ductile Iron Pipe, the following are the minimum slopes which are allowed:

<u>Sewer Size</u>	<u>Minimum Slope in Feet Per 100 Feet</u>
8 inch	0.40
10 inch	0.28
12 inch	0.22
15 inch	0.17
16 inch	0.14
18 inch	0.12

#### **1.04.08 MANHOLES**

##### **A. LOCATION AND SPACING**

Manholes shall be installed at the end of each line; at all changes in grade, size or alignment; at all intersections; and at distances not greater than 400 feet.

##### **B. CLEANOUTS**

Terminal cleanouts shall not be substituted for manholes. However, terminal cleanouts may be approved under Special Conditions by Easton Utilities on a case by case basis. Under no conditions shall terminal cleanouts be installed at the end of a main line sewer greater than 150 feet from the last manhole.

C. DROPS

A drop pipe should be provided for a sewer entering a manhole at an elevation of 21 inches or more above the manhole invert. Where the difference in elevation between the incoming sewer and the manhole invert is less than 21 inches, the flow channel should be filleted to prevent solids deposition.

D. MINIMUM DIAMETER

The minimum diameter of manholes shall be 48 inches. Larger diameters are required for drop connections in new construction. A minimum access diameter of 24 inches shall be provided.

E. FLOW CHANNELS

The flow channel through manholes shall be concrete or brick and mortar, conforming in shape and slope to that of the sewers. The top of the brick channel shall be at the same elevation as the crown of the main sewer line in the manhole. Channel shall drop a minimum of 0.10 foot from influent pipe to the effluent pipe unless otherwise approved.

END OF SECTION