



FLOW ESTIMATION POLICY FOR DESIGN OF SANITARY SEWERS

A. New sewer systems or extensions of existing systems will not allow for the introduction of storm water where the treatment facility is designed to receive only sanitary sewage or water borne industrial waste. In cases where the treatment facility is designed to accept combined flow, no net increase in storm water shall be allowed to enter the system.

B. Rainwater from roofs, catch basins and other areas, and groundwater from foundation drains shall be excluded from the sewer system.

C. Flows

1. **Non-residential Flows:** The average daily flows generated by existing or proposed commercial, industrial, institutional, governmental or other non-residential facilities shall be estimated based on historic water usage records, wastewater flow measurements or referenced design standards acceptable to the OWR.
2. **Residential Flows:** The average daily flows (ADF) generated by households[†] to be serviced by sewers shall be estimated based on one of the following:
 - (a) For existing households serviced by a municipal water supply, actual historic water usage shall be used. In communities serviced by a municipal water supply, water usage data is readily obtainable through the local Water Department, Company or Authority.
 - (b) For any households where direct historic water usage data is not available or does not exist, historic water usage data from similar neighborhoods within the service area may be used.
 - (c) For proposed or existing households, wastewater flow data obtained from similar neighborhoods within the service area may be used. Wastewater flow data must be based on continuous monitoring for a period of at least one (1) week during the wet season and such data shall be no more than two (2) years old.

The estimation of residential flows shall be based on the data collected as explained in (a), (b) or (c) above. If the ADF's, based on such data, are less than three hundred gallons per household per day (300 gphd), then a minimum of 300 gphd shall be used.

When water usage or wastewater flow data are shown not to be available and, in the opinion of the engineer, the situation warrants the use of ADF's in excess of 300 gphd, documentation shall be provided justifying the use of an alternative estimated flow.

3. Average Daily Flow - Flows calculated per Items C.1 and C.2 shall be augmented to account for ultimate tributary flow based on current zoning for the service area and consistency with the community's Wastewater Facilities Plan, plus an allowance for infiltration as stipulated in Item C.5 below.

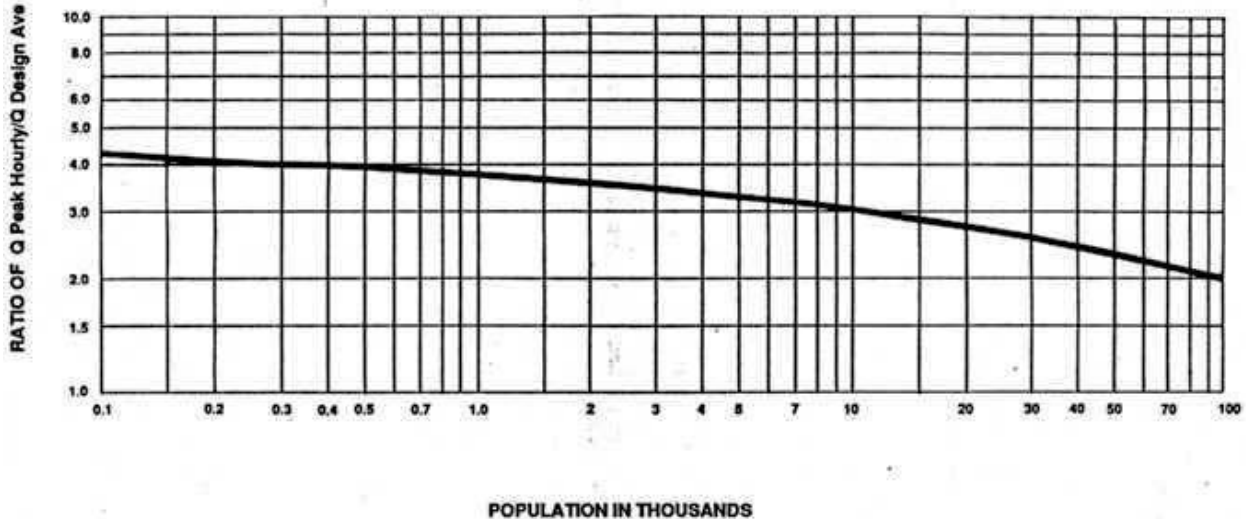
4. Peak Flow - Average daily flow shall be peaked using the ratio of peak hourly to design average flow as determined from Figure 1 or other sources determined to be acceptable to the OWR.

5. Infiltration - An allowance for infiltration shall be calculated on the basis of 250 to 500 gallons per day per inch diameter per mile of sewer pipe. Amounts in excess of this limit may be allowed if supporting documentation is provided and is determined to be acceptable to the OWR.

6. Design Flow - Sanitary sewers shall be designed for flows calculated in Item C.4 plus the infiltration allowance as calculated in Item C.5.

[†] "Households" may be defined as single family homes, duplexes, apartments, condominiums, mobile homes, or any other structures which are used solely as living accommodations.

**FIGURE 1.
RATIO OF PEAK HOURLY FLOW TO DESIGN AVERAGE FLOW**



Q peak hourly: Maximum Rate of Wastewater Flow (Peak Hourly Flow)

Q design ave: Design Average Daily Wastewater Flow

Source:
$$Q \text{ Peak Hourly} / Q \text{ Design Ave} = \frac{18 + \sqrt{P}}{4 + \sqrt{P}} \quad \dots \quad (P = \text{population in thousands})$$

Fair, G.M. and Geyer, J.C. "Water Supply and Waste-water Disposal"
1st Ed., John Wiley & Sons, Inc., New York (1954), p. 136

Note: This figure is equivalent to the one found in "GLUMRB - Recommended Standards for Wastewater Facilities - 1990 Edition", page 10-5.