



**CITY OF DALY CITY
DESIGN STANDARDS**

JULY 2004/2008

SECTION 4 – SANITARY SEWER SYSTEM

4.01 SCOPE

This section covers the general design requirements, design, and treatment criteria applicable to the sewerage system as a whole.

4.02 DESIGN CALCULATIONS

Design calculations submitted for Engineering Division review shall be in a neat acceptable form, and shall indicate the date, signature of the Engineer, and the Engineer's State of California Registration Number.

Design calculations will be required for all subdivision sewers or where, in the judgment of the Engineer, they are necessary.

A. Sewers and Pipelines

Design calculations for sewers and pipelines shall be presented in tabular form and shall include the following information for each section of sewer: terminal manhole designation, ground elevations at the terminal manholes, incremental and cumulative tributary areas, incremental and cumulative tributary population, incremental average and maximum domestic sewage flow, incremental infiltration allowance, cumulative design flow, invert elevations or terminal manholes, length of sewer run, and sewer size, slope, capacity and velocity. Design calculations shall show conformance to "Criteria for Separation of Water Mains and Sanitary Sewers" (California Waterworks Standards), as contained in Section 64630, Title 22, California Administrative Code.

B. Pumping Stations

Design calculations for pumping stations shall include soils data, structural, electrical, and mechanical design calculations, hydraulic calculations, including the basis for average and peak flows, calculations for wet well volume, curves indicating force main characteristics, and individual and combined pump head-capacity curves.

4.03 UNIT DESIGN FACTORS

A. Population Densities.

Population densities for determining ultimate tributary population shall be as indicated in the report on file at the District Office. Those densities shall be modified where conditions are known to be different. In the case of such modifications, the applicant shall submit substantiating data.

B. Sewage Flow

1. Per Capita Domestic Sewage Flow -- The average dry weather per capita domestic flow shall be taken as ninety (90) gallons per day.

2. Ratio of Peak to Average Flow – The ratio of peak to average dry weather sewage flow is a function of the tributary population, and the following tabulated values shall be used.

Population	Ratio of Peak to Average Sewage Flow
1,000 and less	2.50
2,000	2.25
3,000	2.15
4,000	2.05
5,000	1.98
10,000	1.82
20,000	1.68
50,000	1.55

3. Commercial Sewage Flow -- Sewage flow for commercial areas shall be determined in accordance with the type of use, recycling, number of weighted fixture units and a flow rate of thirty (30) gallons per day per weighted fixture unit.

4. Industrial Sewage Flow -- Sewage flow for industrial areas shall be determined by the proposed type of industry and the recycling requirements. If the type of industry is unknown, design values shall be three thousand (3,000) gallons per acre per day average flow and nine thousand (9,000) gallons per acre per day peak flow.

5. Infiltration -- The infiltration rate shall not exceed two hundred (200) gallons per day per inch diameter per mile of length on all new sewers.

6. Inflow Sources -- No inflow sources which include rainwater, stormwater, groundwater, street drainage, subsurface drainage, roof drainage, yard drainage, and water from yard fountains, ponds or lawn sprays or any other uncontaminated water shall be discharged into the public sewer.

4.04 GRAVITY SEWERS

A. Minimum Size Main Sewer

The minimum diameter for main sewer shall be eight inches (8").

B. Minimum Size Side Sewer

The minimum diameter for side sewers shall be four inches (4"). For side sewers serving commercial or industrial buildings, or multiple family living units having four (4) or more units, the minimum diameter shall be six inches (6").

C. Minimum Slopes

For side sewers, the minimum slope shall be two percent (2%) for four inch (4") and one percent (1%) for six inch (6"). For main sewers, the minimum slope shall be that required to obtain a velocity of two feet (2') per second when the sewer is flowing full or one-half full. For the purpose of computing velocity, the Manning's coefficient of roughness "n" shall be 0.015 for sewers eight inches (8") in diameter and smaller, and 0.013 for sewers larger than eight inches (8") in diameter.

D. Steep Slopes

For main sewers installed on steep slopes, special design features may be required. Depending upon conditions of the specific installation, such items as underdrains, check dams, special anchorage, or special pipe material may be required. Based upon data supplied, the Engineer will assess each case and recommend certain special requirements.

E. Minimum Depth

The minimum depth of cover for any public sewer shall be three feet (3'). If it is impossible to obtain the specified minimum depth, the sewer shall be encased in concrete or use ductile iron pipe.

For side sewers, minimum depths of cover shall be as follows:

1. At the property line - 3 feet.
2. From property line to within eight feet (8') of the building plumbing - 2.5 feet.
3. At the building plumbing connection - 2.0 feet.

When the minimum depths of cover listed above are impossible to obtain the use of cast iron or concrete encased pipe shall be required.

F. Manholes

Manholes shall be provided at every line or grade change and at every point where the sewer changes size. In addition, manholes shall be provided at maximum intervals of three hundred feet (300') on sewer twenty one inches (21") in diameter and smaller, and three hundred feet (300') on sewers larger than twenty one inches (21") in diameter. Manholes shall be eccentric.

G. Flushing Inlets or Rod Holes

Flushing inlets or rod holes may be permitted on dead-end runs where the length of the sewer downstream to the next manholes is less than one hundred fifty feet (150').

H. Types of Pipe Permitted

Complete specifications for all approved pipe materials are given in Section 02720, "Sanitary Sewer Collection System." Limitations on the use of specific pipe materials are listed below.

1. Gravity Sewers -- Only VCP or D.I. pipe shall be permitted.
2. Force Mains -- In general, glass lined ductile iron pipe shall be used for force mains.

I. Cleanouts and Side Sewers

Each side sewer shall have a cleanout installed near the back of the street right of way line as per the local Plumbing Code and City Standard Drawings and Specifications. The cleanout may be within the sidewalk area in areas where building construction is allowed with zero setbacks.

J. Backwater Overflow Device or Check Valve

Side sewers connecting houses having a finished floor elevation twelve inches (12") or less above the top elevation of the nearest upstream structure shall have a backwater overflow device or check valve installed on them next to the cleanout. When conditions exist where the sewage cannot overflow on the area surrounding such installation without damage to property, a backwater check valve and shutoff system shall be installed in accordance with Standard Drawing SS-12 of the City of Daly City Standard Specifications.

4.05 FORCE MAINS

Force mains shall be designed using a Hazen and Williams coefficient or roughness "C" of 150 for glass lined ductile iron pipe.

4.06 PUMPING STATIONS

Certain basic requirements for pumping station design are listed below:

A. Stand-by Power

Each pumping station must be equipped with a source of stand-by or emergency power, which will automatically start upon the failure of external power. In special cases, the Engineer may waive this requirement.

B. High Water Alarm

Each pumping station must be equipped with the necessary electrical equipment to transmit a high water alarm over a leased telephone circuit to a remote alarm panel.

C. Architectural Considerations

Each pumping station must blend harmoniously with neighboring structures. Architectural considerations shall include the superstructure, ornamental fencing, landscaping and other design features that may be required by the City of Daly City Department of Economic & Community Development.

D. Access/Easements

Sewer mains shall be located in street right of ways or dedicated easements to facilitate access for maintenance and repair. Departure from this design policy shall require prior approval of the Engineer.

E. Telemetry Capability

New facilities shall be designed to provide the capability for the installation of a telemetry system.

- End of Section -