

**CITY OF BURBNK
PUBLIC WORKS**

Sewer Design Guidelines

This policy provides the framework by which public sanitary sewers are to be designed in the City of Burbank. Sanitary sewers carry the spent water supply of a community, industrial wastes, and unavoidable amounts of inflow and infiltration to a satisfactory point of treatment and ultimate disposal. Sewer capacity should be provided based on careful consideration of present and probable future flows of domestic sewage and commercial and industrial wastes. Materials and installation shall be per the latest edition of the Standard Specifications for Public Works Construction.

1. Flows

Sewage design flows are based on user/occupancy flow generation rates. User/occupancy flow generation rates for the City of Burbank are shown in Table 1. Certain commercial and industrial operations may contribute significant flows to the sewer system. These flows may vary significantly depending on industry type, size operational techniques, and onsite pretreatment. In these instances, the Deputy City Manager/Public Works and Capital Improvements or his/her successor and/or designee (hereafter referred to as Director) may require the calculation of a site-specific flow generation rate.

Table 1 – Sewer Flows

User/Occupancy Type	Unit of Usage	GPD/Unit
Group I - Residential		
Multi-Family Apt or Condo	Dwelling Unit	183.00
Mobile Home Park	Dwelling Unit	155.28
Single Family Residential	Dwelling Unit	215.00
Dormitory or Boarding House	Bed	74.65
Group II - Commercial (Low Strength)		
Agricultural/Landscaping Service	1000 SF	21.35
Amusement & Recreation Services: Outdoor	Entrant	8.54
Apparel Product Manufacturing	1000 SF	85.39
Apparel and Accessory Store	1000 SF	68.31
Auto Parking	1000 SF	21.35
Bar or Night Club without Restaurant	1000 SF	348.38
Bar or Night Club without Restaurant	Seat	17.92
Barber Shop	1000 SF	85.39
Beauty Shop	1000 SF	239.08
Bowling/Skating	1000 SF	68.31
Car Wash (Tunnel Area, with Recycling)	1000 SF	3236.91
Construction Service (Field Office)	Office	128.08
Department and Retail Stores (No Restaurants)	1000 SF	85.39
Durable Goods - Wholesale Trade	1000 SF	68.31
Freight Trucking Services & Warehousing	1000 SF	17.08
Furniture and Fixture Manufacturing	1000 SF	21.35
Grocery Market w/out Butcher or Baker	1000 SF	85.39
Health Services: Hospital	Bed	170.56
Health Services: Other	1000 SF	284.27
Health Services: Psychiatric/Convalescent	Bed	71.07

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Table 1 – Sewer Flows

User/Occupancy Type	Unit of Usage	GPD/Unit
Health Services: Surgical	Bed	426.41
Health Spa	1000 SF	234.81
Homeless Shelter	Bed	71.07
Laundromat, Public	Washer	287.83
Lumber Yard, Hardware or Gardening Sales	1000 SF	85.39
Machine Shop (Excluding Electrical)	1000 SF	68.31
Manufacturing, Other	1000 SF	68.31
Massage Parlor	1000 SF	234.81
Motion Pictures, Indoor Amusement	1000 SF	68.31
Motion Pictures/Theater/Auditorium	Seat	3.42
Museum, Art Gallery	1000 SF	17.08
Nursery or Greenhouse	1000 SF	21.35
Professional Offices	1000 SF	110.12
Railroad Transportation Facility	1000 SF	85.39
Recreational Vehicle Park	Space	54.75
Restaurant: Preprocessed Food	1000 SF	119.44
Shopping Center	1000 SF	85.39
Storage, Outdoor	1000 SF	21.35
Studios: Production/Recording Sound Stage	1000 SF	68.31
Veterinarian	1000 SF	239.08
Warehouse Storage, Indoor	1000 SF	17.08
Wholesale Trade/Sales	1000 SF	85.39
Group II Low Strength Not Listed	1000 SF	86.92
Group III - Commercial (Medium Strength)		
Air Transport Fixed Facility	1000 SF	106.50
Bar or Night Club with Restaurant	1000 SF	656.27
Beverage Manufacturing	1000 SF	948.07
Chemicals & Allied Product Mfg	(a)	
Hotel, Motel or Lodging (Excluding Dining)	Room	133.36
Kennel	1000 SF	127.84
Laboratory	1000 SF	287.88
Laundromat, Commercial	Washer	143.79
Laundry, Industrial	1000 SF	7591.95
Mall (with Food Services)	1000 SF	124.91
Medical Lab	1000 SF	284.74
Metal Industry	(a)	
Mortuary	1000 SF	154.90
Plastic Product Manufacturing	(a)	262.32
Printing, Publishing & Allied Industry	1000 SF	262.32
Repair Station, Automobile	1000 SF	137.38
Service Station, Automobile	Station	525.59
Textile Manufacturing	(a)	
Transport Equipment Manufacturing (Including Aircraft)	(a)	262.32
Water Supply Service	(a)	262.32
Wood Product Manufacturing	1000 SF	41.23
Group III Medium Strength Not Listed	1000 SF	102.37
Group IV - Commercial (High Strength)		

(a) Evaluate individual process discharges. Default value is as shown.

Bakery	1000 SF	771.32
Dairy Product Manufacturing	1000 SF	1592.39
Food Product Mfg (Industrial)	1000 SF	412.94
Hotel with Dining Facilities	– Allocate to Restaurant and Lodging	
Paint Manufacturing and Usage	(a) ^a	1119.00
Restaurant or Deli: Take-out	1000 SF	826.42
Restaurant, Cafeteria or Full Service	Seat	66.11
Restaurant, Fast Food	Seat	55.09
Restaurant, Other	1000 SF	2272.65
Restaurant: Coffee/Donut Shop	1000 SF	771.32
Supermarket (Grocery) with Butcher or Baker	1000 SF	404.02
Group IV High Strength Not Listed	1000 SF	826.42
Group V – Institutional		
Church	1000 SF	42.69
Church	Seat	4.27
Community Center (No Kitchen)	Occupant	3.42
Membership Organizations	1000 SF	106.73
Prison with Food Services	Inmate	186.71
School: Day Care, Elementary & Junior High	Student	7.59
School: High	Student	11.39
School: Other	1000 SF	151.88
School: Private	1000 SF	151.88
School: University or College	Student	15.19
School: Vocational	Student	11.39
Social Services	1000 SF	124.42
Group V Institutional Not Listed	1000 SF	106.73

2. Alignment

The proposed sewer shall be located in the street or alley, (not in the parkway) unless directed by the Director. The sewer trench shall not extend under the edge of gutter. The sewer trench shall not extend under the edge of a raised median curb. When the sewer cannot be located within the street or alley, it shall be located in an approved easement.

New easements parallel to a lot line shall be fully contained within one lot. Sewer easement width shall be a minimum of 15-feet or two times the average depth of cover to the top of pipe whichever is greater. The maximum easement width for a sewer pipe shall be 25-feet. Maintenance access to the easement shall be a minimum of 15-feet wide paved all weather access. Pavement section must be approved by the Director. Location of maintenance access must be approved by the Director. Easement for public sewers shall be dedicated to the City on a recorded map or by a separate deed with the approved easement exhibit and legal description including closure calculations.

(a) Evaluate individual process discharges. Default value is as shown.

A minimum radius of 150-feet shall be used for any horizontal bend. Maximum deflection at any joint shall not exceed the smaller of two (2) degrees or the maximum deflection recommended by the pipe/gasket manufacturer.

Minimum horizontal spacing between sewer pipe and potable and/or reclaimed water pipes shall be 10-feet from outside of pipe to outside of pipe, as required by the California Department of Health Services.

A trenchless method such as pipe jacking, boring, directional drilling or micro tunneling may be required by the Director. When a trenchless method is required, details must be shown on plans. 18-inch minimum diameter cast iron pipe with 3/8-inch wall thickness is the required casing pipe for an 8-inch diameter PVC SDR-35 carrier pipe.

Each lot shall be provided with a sewer lateral stubbed to the edge of the right of way unless directed by the Director.

3. Velocity

Gravity sewer shall be designed for a minimum velocity of two feet per second using the average daily flow that exists at the time the pipe is placed into service. The Director's approval is required when using design velocities of less than two feet per second.

Gravity sewer shall be designed for a maximum velocity of ten feet per second using the average daily flow that exists at the time the pipe is placed into service. The Director's approval is required when using design velocities of greater than ten feet per second.

4. Open Channel Flow

Open channel flow will be the basis for the general hydraulic design of sanitary sewers. Open channel flow occurs when the conduit is partially full and the hydraulic grade line (HGL) is below the crown of the conduit and a free water surface develops in the sewer. For design purposes, the sum of all flows entering into a given run of sewer is assumed to enter the pipe at its upstream end.

Sewers shall be designed to minimize the possibility of creating a hydraulic jump. Supercritical flow should be avoided, as any rapid decrease in flow velocity due to pipe slope change will produce a hydraulic jump. Significant changes in pipe slope maybe accommodated using vertical curves to avoid hydraulic jump.

Manning's equation will be used to determine depth of flow for open channel conditions. The roughness coefficient to be used for new pipe is as follows:

Vitrified Clay Pipe (VCP)	n = 0.013
Ductile Iron Pipe (DIP)	n = 0.013
Poly Vinyl Chloride Pipe (PVC)	n = 0.010

The maximum allowable design depth of flow to pipe diameter ratio (d/D), for sewers up to 18-inches in diameter, is 0.50. The allowable d/D for pipes 18-inches and greater in diameter is 0.75.

5. Materials

Sewer pipe shall be Vitrified Clay Pipe (VCP); epoxy lined and coated Ductile Iron Pipe (DIP) or solid wall Poly Vinyl Chloride pipe with a minimum SDR of 35 (PVC). Alternative pipe materials may be used with the approval of the Director. Pipe Characteristics and installation shall be per the latest edition of the Standard Specifications for Public Works Construction.

6. Pipe Bedding and Trench Section

Bedding details and the trench section shall be shown on plans. Concrete encasement is required when outside pipe wall to outside pipe wall clearance between the sewer pipe and any other structure is less than 18-inches or when required separation with a water line cannot be maintained. Concrete encasement is required when the depth of cover to the top of pipe is less than four feet except for ductile iron pipe (DIP). Concrete encasement is required when the depth of cover to the top of ductile iron pipe (DIP) pipe is less than three feet.

Slope anchors and backfill stabilizers are required where the pipe slope exceeds 30%. Slope anchors shall be placed per APWA Standard Plan 221-1.

Where a new sewer crosses under an existing water line, sewer trench shall be backfilled 1-sack slurry for a minimum of 5-feet on either side of the water line.

7. Maintenance Holes

Maintenance holes shall be constructed at intersecting mains, B.C., E.C., angle points and change in pipe size or grade. Maximum spacing between maintenance holes shall be 300-feet.

Maintenance holes shall conform to APWA Standard Plan 200-2 or 201-0. The maintenance hole cover diameter must be a minimum of 30-inches.

Maintenance holes shall be constructed at the end of a sewer; a 4-foot stub out for a future connection must be constructed. Stub out shall have the same diameter as the downstream pipe exiting the maintenance hole. Stub out shall be plugged with a stopper. Stoppers shall be one of the following: polyethylene (PE), polyurethane, polypropylene, acrylonitrile-butadiene-styrene (ABS), polyvinyl chloride (PVC), ozone resistant synthetic rubber, clay discs, or other material as approved by the Director.

In unpaved areas, the top of the maintenance hole cover shall be set at an elevation not less than 1-foot above the surrounding terrain.

Drop maintenance holes shall be avoided. The use of a drop maintenance hole must be approved by the Director.

Minimum elevation drop through the maintenance hole shall be 0.10-foot for straight runs with no change in pipe size. A minimum drop of 0.20-foot through the maintenance hole shall be required for changes in pipe size and for right and acute angles.