

CHAPTER 4 - WASTEWATER COLLECTION

4.00 General Approval Requirements

- A. In the sewer service area, sewer main extensions are required to assure orderly and adequate extension of the sewer utility system. These extensions are to be in accordance with requirements of development and service availability as established by the City and the Washington State Department of Ecology.
- B. Design and construction of sewer mains and facilities, including but not limited to: sewer lift stations, telemetering facilities and appurtenances shall be in compliance with the latest addition of the City's ordinances, latest revision to the City's General Sewer Plan, these Standards, the Standard Details and the latest issue or revision of "Criteria for Sewage Work Design" published by the Washington State Department of Ecology.
- C. Sewer mains shall be extended through and to the extremes of the property being developed, to provide connection points for future development of unserved property as determined by the City.
- D. Side sewer permits for commercial and multifamily projects will be issued to owners as an extension agreement pre-construction requirement and shall be installed by a bonded contractor. The owner is required to make application and pay all necessary fees to obtain a permit. The side sewer can be installed as part of the mainline extension and put in use only after acceptance of the mainline system by the City. Side sewer permits for plats will be issued for installation only after main line extensions are accepted by the City. The lot owner or his bonded contractor is required to make application and pay all necessary fees, obtain a side sewer permit and connect the side sewer from the mainline lateral to the house plumbing.
- E. For multifamily residential developments, mobile home parks, RV parks, commercial facilities, and industrial facilities, public sewers shall be extended through easement to individual structures. For purpose of reducing infiltration, such extensions of public sewer shall be made to the limits of the roadway, parking access serving said buildings. Sewers shall be routed across pavement whenever possible. Each building shall be served by a lateral from the public sewer with a cleanout located in close proximity to the connection between the lateral and public sewer.

4.01 Planning Criteria

- A. Ensure adjacent properties can be provided sewer service (extend to extreme of property and designed for the ultimate development of the tributary areas).

Sewer service shall be provided by a gravity system (unless approved by the City).

In areas of the City where it is determined by the City that conventional gravity sanitary sewer service is not available, septic tank systems may be installed upon approval and issue of permit by the Southwest Washington Health Department.

- B. Demand Projections:

Unit Demands:

Residential - 70 gallons per capita per day (GPCD)

Commercial - 20 GPCD

Peaking Factors:

1. Where average day demands are 50 gallons or less, the design peaking factor shall be 4.
2. Where average day demands are between 50 and 1000 GPM, the design peaking factor will vary linearly between 4 and 2.5 respectively.
3. Where average day demands are greater than 1000 GPM the design peaking shall be 2.5.

- C. Infiltration/inflow (I/I) allowances

X For new systems an I/I allowance of 1100 gallons per acre per day (GPAD) shall be used.

X On existing sewer systems, I/I allowance shall be determined through a capacity analysis.

- D. System Parameters

- X New sewer lines shall be designed so that under ultimate development peak flow, including I/I, shall not exceed 50% capacity of the line. Existing lines can have peak flows to 75% capacity of the line. Capacity analysis using an approved sewer model shall be conducted to verify sewer flows.

- X No connections to storm drainage system shall be made to the sanitary sewer system, unless approved by the City and only under special circumstances, i.e. covered parking, wash down areas around garbage collection dumpster with an area less than 200 sq. ft.

4.02 General Design Standards

- A. Check that base map conforms to all requirements listed in the water and sewer utilities standard plan format per Chapter 1.
- B. Check with City to determine how surrounding development will affect design (e.g. serve to extreme of property if adjacent property has potential for future development).
- C. Check with local jurisdiction for necessary permitting requirements.
- D. Cap end of existing sewer lines to be abandoned as follows:
 - X Asbestos cement lines: use end cap coupling equal to ROMAC EC501.
 - X Cast or ductile iron lines: use M.J. cap or plug
 - X Clay or concrete lines: fill end of line with cement concrete minimum of 12" from end of line.
 - X Plastic lines: use cap or plug fitting compatible with plastic pipe to be abandoned.

4.03 Main Lines

- A. Minimum Pipe Size
 - X Minimum pipe size shall be 8 inches.
- B. Pipe Slope

- X Minimum slope shall be 0.05 ft/ft for 6 and 8 inch diameter mains.
- X Maximum main line slope shall not induce velocities greater than 10 feet per second under daily peak flows.
- X Pipe anchor blocks shall be shown at 20' on center where pipe slope exceeds 20%.

C. Horizontal Locations of Utilities

- X Locate sewer mains in public right-of-way per City Standards.
- X Outside of right-of-way, locate utilities in easements through paved areas wherever practical. Particular attention should be given to avoiding landscaped areas where trees may be planted.

4.04 Side Sewers

- A. 6" pipe shall be used for side sewer from main line to 5' past edge of property line (unless expected flows require larger size line).
- B. 4" minimum pipe shall be used for residential side sewers from end of 6" side sewer to building. Commercial side sewers shall be a minimum 6" pipe.
- C. Side sewer shall have minimum 6' of cover at property line. Greater depths may be required where elevation of lowest floor to be served is lower than surface elevation at property line.
- D. When minimum first floor elevation is shown on a lot (i.e., lot is low in relation to other lots in the plat), do not use common stub to serve this and adjacent lot. Provide a single stub to "low" end of each lot.
- E. Side sewers shall connect to main sewers with tee rather than a wye, unless otherwise approved by the City. On plan, indicate station of side sewer tee from nearest downstream manhole. Also indicate length of side sewer from main to plug at end of 6" line.
- F. Minimum side sewer slope shall be 2 percent. Maximum slope shall be 100 percent.

4.05 Manholes

- A. Maximum length of main line between manholes shall be 400 feet.

- B. All manhole covers shall be set flush with ground surface, except where otherwise designated by the City. Manholes in easements shall have locking lids.
- C. Concrete perimeter seals shall be provided around all manhole adjustment sections in easement areas:

Paved areas- asphalt concrete per standard detail.

Unpaved areas- cement concrete per standard detail.

- D. Terminal manholes (at end of main)
 - X Side sewer stubs shall not connect to terminal manholes when there is a potential for future main line extension from manhole.
 - X Terminal manholes (without side sewer connection) shall not be channeled. Slope manhole base to provide positive drainage toward pipe, use 3,000 psi cement concrete.
- E. Where side sewer connects to manhole, invert of side sewer shall be equal to or above main sewer crown, but not to exceed 18" above invert of main sewer.
- F. Drop in invert elevation across manhole shall be from 0.1 ft to 0.2 ft. In areas with sewer main slopes less than 0.005 ft/ft, lesser drops are allowed, to be determined by the City.

G. Manhole Sizing

48" manhole

1. 2 connecting pipes, 8" diam. to 12" diam.
2. 3 connecting pipes, 8" diam. to 10" pipe.
3. 4 connecting pipes, 8" diam.

54" manhole

1. 2 connecting pipes, 15" diam. to 21" diam.

2. 3 connecting pipes, 10" diam. to 15" diam.
3. 4 connecting pipes, 10" diam. to 12" diam.

72" Manhole

1. 2 connecting pipes, 21" diam. to 24" diam.
2. 3 connecting pipes, 15" diam.
3. 4 connecting pipes, 15" diam.

For other pipe configurations, the size of the manhole will be investigated on a case by case basis.

The minimum angle between the incoming and the outgoing pipe shall be 90°; pipe shall be radial with the center of manhole.

The above configurations shall provide adequate shelves and room for maintenance and performing T.V. inspections.

- H. Channels shall be centered in manhole.
- I. Ladder rungs shall be placed on side of manhole with largest shelf.
- J. Any manhole less than 5" deep (rim to invert) shall have a concentric cone. All other manholes shall be provided with eccentric cone.

K. Minimum manhole depths (invert to top of rim):

Manhole Size	Pipe Size	Min Mh Depth	Comments
48"	6"	3.0'	Special manhole per Std. Detail.
	8"	3.2'	
	10"-12"	3.5'	
54"	8"	3.7'	Special manhole per Std. Detail.
	10"-12"	4.0'	
	15"-18"	4.5'	
72"	15"	8.0'	Flat top manhole, 2 Access lids (one Over each major pipe Entrance/exit.
	18"-24"	8.5'	
	27"	9.0'	

72" manholes over 11.5' in depth shall include 48" reducing section per std. detail.

- L. Glass fiber supported plastic or PVC-hard lined manhole channels will be allowed at contractor's option.

4.06 Pipe Class / Protection / Cover

- A. Polyvinyl chloride (PVC) pipe class designation:

All sewer pipe shall be SDR 35 PVC conforming to ASTM D3034, unless otherwise determined by the City.

Depth of cover over SDR 35 PVC pipe shall be 3' minimum and 20' maximum. Pipe depths outside this range will require use of pressure class PVC conforming to AWWA C900 (dimension ratio 18 or less).

PVC pipe shall be encased in steel casing when crossing under rockeries or retaining walls over 3' high. Casing to extend beyond footings or rockery face a minimum of 5' or the height of the wall or rockery, whichever is greater.

- B. Ductile iron pipe, class 52, shall be used only where required by the City.
 C. All buried metal pipe shall be encased in 8-mil polyethylene per AWWA C-105, where

required by the City.

D. Building setback requirements:

- X 5' minimum from covered parking.
- X 10' minimum from buildings and retaining walls, or equal to depth of pipe, whichever is greater.
- X 20' minimum easement shall be provided between buildings.
- X When pass between any two buildings (residential or commercial, etc.) which are 25' apart or less: the sewer line shall be oversized two (2) nominal pipe sizes above the capacity requirements between nearest manholes beyond limits of buildings.

4.07 Clearances / Other Utilities

- A. Water services and sewer stubs shall have at least 5' horizontal separation.
- B. Check for crossing or parallel utilities. Maintain minimum vertical and horizontal clearances. Avoid crossing at highly acute angles (smallest angle measure between utilities should be between 45 and 90 degrees).
- C. Horizontal clearances from sanitary sewer:

Cable TV	5'
Gas	5'
Power	10'
Storm	5'
Telephone	10'
Water	10'

- D. Vertical clearances from sanitary sewer:

Cable TV	1'
Gas	1'
Power	1'
Storm	1'
Telephone	1'
Water	2'

- E. Where sewer crosses above or below watermain, one full length of sewer pipe shall be used with the pipes centered for maximum joint separation.
- F. Send letter and preliminary plan to existing utilities to inform them of new construction. Request as-built information and incorporate into plans. At minimum the following utilities should be contacted:

- Cable television
- Natural gas
- Power
- Telephone

4.08 Connections to Existing Systems

- A. New sewer mains (8" and larger) shall connect to existing sewer main at existing manholes, or with new manhole on existing sewer per standard detail.
- B. Where new main is larger in diameter than existing downstream main, check that capacity of existing main is not exceeded by flow from new main.
- C. When connecting to existing manhole, check that requirements of Section 4.05K above are satisfied.
- D. If connecting to existing manhole which has access less than 24" in diameter and/or concentric cone (manholes over 5' deep), manhole shall be upgraded to include new 24" frame and cover and/or eccentric cone.

E. Connections to end of existing pipe:

- X If end of pipe is known to have a bell, and new pipe is same material as existing, plans can specify connection by inserting spigot of new pipe into existing bell end.
- X If existing line is plain end, or must be cut, plans shall specify use of a coupling to connect new and existing lines.

F. Approved couplings for use on sewer mains include:

Ductile iron mechanical couplings (equal to ROMAC) on ductile iron, concrete, or pipes with differing materials or diameters.

On PVC or PE mains, PVC or PE couplings with compatible dimension ratio and gaskets to connect new and existing pipes shall be used.

4.09 Fats, Oils, Grease Separation

- A. Oil/water separator. Whenever an industrial or commercial business generates mineral/petroleum oils exceeding 100 milligrams per liter to be discharged to the sanitary sewer, pre-treatment is required. An oil/water separation device shall be installed by the property owner as specified on various standard details. Selection and sizing of an oil/water separator shall be subject to approval of the City. Water discharged from any oil/water separator to the sanitary sewer system shall not contain in excess of 100 milligrams per liter of petroleum oil, non- biodegradable cutting oil or mineral products to be in compliance with the City of Stevenson Regulations for Discharge to the Sanitary Sewer.
- X Sizing of a separator facility shall be based upon maximum available flow to the separator and provision of a forty-five minute retention time in the separator at that flow, with a minimum capacity of at least 450 gallons.
 - X The oil/water separator shall be covered with removable sections. Access and inspection covers, weighing not more than 30 lbs. And with suitable hand holds, are to be provided directly above inspection "tee" and oil/grit collection compartments.
 - X Only waste water from floor drains and covered parking garages shall drain to the separator. The location and design shall minimize or eliminate the possibility of storm water reaching the separator -- areas over two hundred square feet open to

rainfall shall not drain to the separator. Sewage from restrooms and shower facilities shall not drain to the separator. See standard detail.

- X Allowable materials for construction are as follows:
 - X Tank - concrete
 - X Baffles - concrete, steel plate
 - X The separator shall be located within 20 feet of drive for access by maintenance vehicle.
 - X A sampling tee shall be located on the outlet with a minimum 18 inch drop below the invert. Access to the separator shall be maintained free for inspection and compliance determination sampling at all times.
 - X The effluent discharged from any oil/water separator to the sanitary sewer shall not exceed 100 parts per million total oil.
 - X When pre-treatment is no longer required, the inlet and outlet pipes shall be permanently plugged, the separation chambers pumped out, and the vault removed.
- B. Grease interceptor. Whenever a commercial and/or retail food preparation operation, regardless of size, generates animal/vegetable fats, oils or grease (f.o.g.) waste in excess of 100 milligrams per liter to be discharged to the sanitary sewer, pre-treatment is required. A grease interception device shall be installed by the owner as specified on various City of Stevenson Standard Details. Effluent discharged from any grease interceptor shall contain no more than 100 milligrams per liter animal/vegetable f.o.g. and be in compliance with the City of Stevenson regulations for discharge to the sanitary sewer.
- X Size and design of the grease interceptor shall conform to the Uniform Plumbing Code, Appendix H Standards, and shall be subject to approval by the City. Minimum capacity shall be 1500 gallons except as noted by the City of Stevenson.
 - X Fixtures in the kitchen area which discharge waste-water containing grease are to be connected to the grease interceptor. Such fixtures include dishwashers, pot sinks, range woks, janitor's sink, floor sinks, rotoclones, toilets, urinals, and wash basins shall not flow through the interceptor.
 - X The interceptor shall be located exterior to the building within twenty feet of drive

for access by maintenance vehicles.

- X The interceptor shall be filled with clean water prior to start-up of system. Allowable materials for construction are as follows:
 - X tank - concrete
 - X baffles - concrete, plastic
- X Access to the interceptor shall be maintained free for inspection and compliance determination sampling at all times.
- X When pre-treatment is no longer required, the inlet and outlet pipes shall be permanently plugged, the separation chambers pumped out, and the vault removed.

4.10 Easements

- A. Show easements off roadways and identify width.
- B. Show easements on developer's property. If easement is defined as a constant width on each side of sewer main, then show a segment of the easement and label as typical (typ).
- C. All easements shall be a minimum of 15' in width, unless otherwise approved or required by the City.

4.11 Pump Stations

- A. Pump stations shall only serve those properties which cannot otherwise be served by conventional gravity sewers or septic tanks.
- B. Pump stations shall be approved on an individual basis by the City.
- C. Pump stations shall be designed in strict conformance with the latest edition of the City of Portland, Bureau of Environmental Services, *A Wastewater Pump Station Design Manual* and Washington State Department of Ecology Regulations and Requirements.
- D. Pump stations shall be furnished with provisions for emergency power with 48 hours fuel capacity.
- E. Submersible pump stations shall be Flygt or equal and shall be 460 volt 3-phase.

- F. Electrical panels mounted in unprotected areas will not be allowed. As a minimum, panels shall be located under a shed roof extending three (3) feet in all directions from the edges of the panel.
- G. All pump station sites shall have a paved 15' wide service road and shall be fenced with a lockable gate.
- H. All pump stations shall be equipped with potable water.
- I. All pump stations shall be equipped with City approved telemetry.