



MINIMUM REQUIREMENTS FOR SEWER INSTALLATION

General Construction Specifications:

- A. Pipe used for construction for a building sewer beyond the building plumbing shall be a minimum of four inches inside diameter and shall comply with BMC 13.04.350.
- B. Construction of the building sewer line shall be such as to secure watertight joints and it shall be on a grade of not less than one-quarter inch per foot.
- C. No ninety-degree ells shall be permitted in the building sewer line and all forty-five-degree ells shall have accessible cleanouts.
- D. Building sewers of four-inch diameter shall have cleanouts installed at intervals of not more than fifty feet and sewers of six-inch-diameter and larger shall have cleanouts installed at intervals of not more than one hundred feet.

Prohibited Connections and Discharges:

The connection and/or discharge into any sewer by direct or indirect means of any of the following is prohibited:

- A. Subsoil foundation drains;
- B. Footing drains;
- C. Window well drains;
- D. Door well drains;
- E. Yard drains;
- F. Unroofed basement floor drains;
- G. Overflows from unpolluted water storage facilities;
- H. Clear water from refrigeration, reverse-cycle heat pumps and cooling or air-conditioning equipment installed hereafter, except for the periodic draining and cleaning of such systems;
- I. Roof drains or downspouts from areas exposed to rainfall or other precipitation;
- J. Surface or underground waters from any source;
- K. Any liquid or vapor having a temperature higher than one hundred fifty degrees Fahrenheit;
- L. Any waste that contains more than one hundred parts per million by weight of fat, oil, or grease;
- M. Any gasoline, benzene, naphtha, oil, or other flammable or explosive liquid, solid, or gas;
- N. Any garbage that has not been properly shredded;
- O. Any ashes, cinders, sand, mud, straw, hair, paunch manure, or any other solid or substance in quantities capable of causing obstruction to the flow in sewers or improper operation of the sewerage system;
- P. Any waste having a pH lower than 5.5 or higher than 8.5, or having any other corrosive property capable of causing damage or hazard to the structures, equipment or personnel of the city;
- Q. Any waste containing a toxic or poisonous substance in sufficient quantity to injure or interfere with any sewage treatment process;
- R. Any waste containing suspended solids of such character and quantity that unusual attention or expense is required to handle such materials in the public sewer system or at the King County sewage treatment plant;
- S. Any obnoxious or malodorous gas or substance capable of creating a public nuisance;
- T. Septic tanks.

Grade:

All side sewers shall be laid on a grade of not less than three-sixteenths inches per foot for four-inch pipe, and one-eighth inch per foot for six-inch pipe.



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Distance from Foundation:

Side sewers parallel to the foundation wall of any building shall be laid not less than forty-eight inches therefrom.

Joint Side Sewers:

If a side sewer serves two or more residential structures, six-inch pipe shall be used from the public or private sewer in the street to the wye at the confluence of the separate side sewers.

Joint Cleanouts:

A maximum of four residential structures may be connected to a single six-inch side sewer. Where three or four residential structures are connected to the same side sewer, a six-inch cleanout extending to within six inches to twelve inches of the ground surface will be required at the wye where the upper connection is made. The city may require a forty-eight-inch manhole at the upper terminus of such lines on both residential and commercial tracts in lieu of cleanouts.

Minimum Surface Cover:

- A. Minimum cover for side sewers on private property shall be eighteen inches except as provided in this chapter.
- B. Minimum cover for side sewers at property line shall be six feet, or as determined by the city engineer based upon field conditions, below the crest of the public way at said property line.
- C. Minimum cover for side sewers crossing a ditch in the public way, except as otherwise provided in this chapter, shall be two feet, six inches.
- D. Cast iron or other pipe may be required in special cases.

Single Residential Dwellings:

All side sewers serving a single residential structure shall be a minimum of four inches in diameter to the property line or to its connection with private sewer, and then six inches to the public sewer. All side sewers serving structures other than single residential structures shall be a minimum of six inches in diameter.

Steep Bluff Connections:

On steep bluffs or terrain, the city may permit installation of the line above ground properly supported to the satisfaction of the city. In such case where the ground slope is greater than forty percent; above-ground installation is required, pipe used shall be Class 50 ductile iron pipe with restrained joints, or butt-fused single wall polyethylene pipe. Anchors shall be placed at each ductile iron pipe section or every one hundred lineal feet for single wall polyethylene pipe. Before any installation of this nature is made, the owner will be required to comply with the provisions of BMC 13.04.180(E) concerning the agreement to save the city harmless from damage or injury.

Water Line Crossings:

Parallel water and sewer lines wherever possible shall be laid at least ten feet apart horizontally. Where it is necessary for sewer and water lines to cross each other, the crossing shall be made at an angle of approximately ninety degrees, and the sewer shall be located three feet or more below the water line if possible. Where sewer lines must cross over water mains, a vertical separation of at least eighteen inches between the invert of the sewer and the crown of the water line shall be maintained. The sewer line shall be constructed of ductile iron sewer pipe and shall be pressure-tested to assure water tightness prior to backfilling. The length of sewer pipe shall be centered at the point of crossing so that the joints will be of equal distance and as far as possible from the water lines. The sewer pipe shall be the longest standard length available from the manufacturer.



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Compliance with APWA Specifications:

All installations not specifically covered or described in this chapter shall comply with APWA (American Public Works Association) specifications, current edition and amendments, which is adopted by reference.

Pipe Materials:

- A. Pipes acceptable for standard side sewers and main lines are as follows:
 1. Plain concrete storm sewer pipe;
 2. Reinforced concrete storm sewer pipe;
 3. Solid wall PVC (polyvinyl chloride) sanitary sewer pipe;
 4. Profile wall PVC sanitary sewer pipe (ultra rib or equal);
 5. Ductile iron sewer pipe;
 6. ABS composite pipe.
- B. It is not intended that materials listed above to be considered equal or generally interchangeable for all applications. All sanitary sewer pipes shall have flexible gasketed joints. All pipes shall be clearly marked with type, class, and thickness. Lettering shall be legible and permanent under normal conditions of handling and storage. Installation shall be in accordance with the "WSDOT/APWA Standard Specifications" as approved by the city. The city engineer may require pipe of specified material for certain installation or unusual conditions.

Fittings:

All changes in directions shall be made with one-eighth bends (forty-five degrees), one-sixteenth bends (twenty-two and one-half degrees) or wye branches with straight-through openings plugged for a cleanout. Cleanouts, including those for commercial property, shall be installed at locations approved by the city. The distance between cleanouts shall not exceed one hundred feet unless specifically authorized by the city. Thirty-six-inch special manholes may be required on long runs in lieu of cleanouts. Suitable frames and covers of a type approved by the city shall be used for all cleanouts on commercial property, and shall be cast in a concrete block two feet, six inches by six inches deep, flush with the final paving. Cleanouts which shall extend to within eighteen inches of the ground surface shall be plugged to prevent entrance of dirt, roots, or groundwater. Plugs shall be provided for use with the standard mechanical compression joint of the pipe being used and must be secured against back pressure. All cleanouts not provided with frame and cover shall have a piece of metal the size of an automobile brake drum or larger placed above, but not in contact with the pipe to facilitate locating with a pipe finder. A test tee shall be provided at the point of connection to the sewer main, and at any other required point or points in order to ensure that all portions of the side sewer or private sewer can be tested. All uncompleted risers, cleanouts, castings and concrete blocks shall be installed by the side sewer installer whether before or after final paving of the area directly concerned.

Installation of Pipe:

All sewers shall be laid true to grade with the bells upgrade. Pipe shall be carefully centered prior to jointing. The bottom of the trench shall be smooth and free from large rocks which may injure the side sewer pipe. When unsuitable bedding is found, as determined by the city's inspector, the side sewer installer shall over-excavate and prepare a bedding of sand or gravel a minimum of four inches deep. Gravel shall be three-quarter-inch maximum size. Backfilling of trenches shall be carefully performed by and to a depth of six inches above the pipe to avoid damaging the pipe. All backfill between the public or private sewer and property line shall be compacted in a manner approved by the city's inspector unless otherwise required by the county, city or town having jurisdiction over the public way. A minimum of four inches of bedding gravel shall be installed for all pipe installed in the public way or traveled areas in commercial properties.



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Connection Methods:

- A. Where a wye or tee is not available, a saddle tee shall be used for all connections to the public sewer except in instances where the city determines that connection by grafting is indicated. The city will supervise the cutting of all holes in eight-inch, ten-inch, and twelve-inch pipe. The pipe cut-in shall be carefully made and all broken pieces removed. If the pipe becomes cracked during the cut-in the damaged section shall be replaced with a wye branch or tee. If grafting is authorized the grafting tee shall be a stub not longer than eight inches overall and shall not be inserted in the public sewer beyond the inside face of the pipe. A liberal collar of mortar shall be placed around the joint, plus a concrete encasement. Extra care shall be taken in backfilling and around and over the joint to prevent breaking. A city inspector must be present during all grafting or cutting operations. If the type of wye or tee provided in the public sewer does not match the proposed side sewer pipe joint detail, a short transition piece shall be joined to the wye branch or tee by means of a gasket of the type used in the public sewer where possible. If this gasket type is not available, careful caulking with an approved caulking material made especially for that purpose may be used. The balance of the side sewer shall then be constructed with compression-type flexible gaskets up to the point of connection with the house plumbing.
- B. Connection to the house soil pipe shall be made by means of a flexible clamp-type coupling or other approved method.
- C. All tee connections must be clean and visible during inspection. The first length of pipe installed at the tee shall not be more than two feet long.

Lifting of Sewage:

Any structure in which the plumbing drain is too low to permit gravity flow to the public or private sewer, the sewage may be lifted by artificial means or grinder pump and discharged into the public or private sewer. The applicant's engineer shall design a sewage artificial lifting means that will provide the necessary capacity to serve the structure. The city engineer shall determine that the proposed artificial lifting means is necessary and will function satisfactorily. No more than one home may be connected to a single grinder pump. Neither pump stations nor public dedicated lifting systems of any kind shall be allowed.

Backflow Conditions:

Wherever a situation exists involving the possibility of a backup, a backwater sewage valve shall be installed. A backwater sewage valve shall be the responsibility of the owner of the side sewer. Before any installation of this nature is made, the owner will be required to comply with provisions of BMC 13.04.180(E) concerning the agreement to save the city harmless from damage or injury. When only the lower floor of a structure is too low for gravity flow, the remaining floors must flow by gravity. All pump installations must meet all applicable codes, and must have approval before installation.

Testing of Final Installation:

Side sewers and/or private sewers shall be tested for their entire length from the public sewer by testing for visible leakage before backfilling by inserting a removable plumber's plug at the lower end of the line and filling the line with water to its highest point. The installer shall make this test before calling for inspection so that the inspector can observe and approve the installation in one visit. The side sewer installer or his job foreman must be present at the job during the inspections. Testing apparatus and water shall be furnished by the side sewer installer. Visible leakage shall be corrected and the line shall be retested. All side sewer trenches must be maintained in a safe condition for the inspector to enter.

Cleanup:

The side sewer installer shall remove all debris and excess material excavation and shall repair all damage, and restore the site immediately after backfilling in public and private areas.