

**DIVISION III
SIDE SEWERS AND BUILDING SEWERS**

III-1.000 DESCRIPTION

1.010 General

- A.** All connections to public sanitary sewers, by connecting to an existing side sewer or building sewer, or by tapping an existing public sanitary sewer line shall be completed in accordance with the applicable forms and agreements from Division I, General Provisions of this document.
- B.** A side sewer is considered to be that portion of a sewer line that will be constructed between a main sewer line and the property line or easement line (whichever is further) of a residence or other building in which the sanitary sewage originates.
- C.** A building sewer is considered to be that portion of a sanitary sewer line that will be constructed from the end of the side sewer to the residence or building in which the sewage originates.

1.202 Side Sewers

- A.** A maximum of two residential units or, depending on design flow, one commercial or multi-family building shall be allowed to connect to each side sewer.
- B.** The minimum side sewer pipe size shall be 6-inch for a single residence and 6-inch for a commercial or multi-family service. Residential side sewers serving two residences may be a single 6-inch side sewer to the property line; branching into two 4-inch building sewers to the two residences, as shown on the County Standard Details.
- C.** The minimum grade shall be 2%. Special circumstances may require consideration of grades less than 2% but will require approval of the County.
- D.** The maximum grade shall be 45%. Grades in excess of 45% will be considered only to resolve exceptionally steep site conditions, and only with the installation of pipe anchors at no more than 16-foot centers in accordance with the County Standard Details.

- E.** The minimum side sewer depth shall be 4 feet, as measured from finish grade to the top of pipe. The design and installation shall anticipate the crossing of other utilities in the right-of-way, with the side sewer typically crossing under these utilities.
- F.** No domestic side sewer connections shall be made directly to any manhole.
- G.** Each side sewer will terminate with a test tee and 6-inch cleanout located at the property/easement line for each lot/building/dwelling to be served, as shown on the County Standard Details.
- H.** A side sewer serving a commercial/industrial building or facility which has the potential of discharging grease, oil and/or chemicals to the sanitary sewer shall indicate so on the permit application. These properties will require the applicant to submit plans indicating the type of and location of grease traps or pretreatment devices installed as part of the building plumbing and a scheduled maintenance plan.
- I.** Pipe bedding and trench requirements shall be as indicated in the County Standard Details for “typical trench section” for the different type pipes and laying conditions.

1.030 Building Sewers

- A.** A maximum of one residential unit or one commercial/multi-family building shall be allowed for each building sewer.
- B.** The minimum building sewer pipe size shall be 4-inch for a single residence and 6-inch for a commercial or multi-family service.
- C.** Minimum grade is 2%. Special circumstances may require consideration of grades less than 2% but will require approval of the County.
- D.** Maximum grade is 45%. Grades in excess of 45% will be considered only to resolve exceptionally steep site conditions, and only with the installation of pipe anchors at no more than 16-foot centers in accordance with the County Standard Details.

- E.** Check dams as per the County Standard Detail shall be placed along the pipe at intervals of 100 feet on sewer mains laid on slopes of 6.0% or greater. Check dam spacing shall be shown on the Plans.
- F.** The building sewer shall be connected to the test tee located at the end of the side sewer and extend to the building to be served.
- G.** No connections from downspouts, gutters, and basement sump pumps or outside drains or an other feature receiving or exposed to rain or groundwater shall be connected to the building sewers.
- H.** PVC building sewer pipes shall not be installed less than 18 inches below the surface of the finished grade and closer than 30 inches from a building.

1.040 Cleanouts

- A.** Cleanouts shall be installed when a side sewer branches to serve two residences, at the property/easement line for each building sewer, at a 100-foot spacing of straight building sewer alignment, and at building connections, or as directed by the County.
- B.** Cleanouts shall be installed at all fitting combinations within an aggregate change in directions in excess of 45 degrees. If combinations of bends have straight pipe turns of 4 feet or greater between bends, that shall not be considered an aggregate change of direction.
- C.** Cleanouts installed in roads, driveways or walkways, paved or unpaved, shall have a frame and cover in accordance with Section III 2.030.

1.050 Underground Utility Locations

- A.** It shall be the responsibility of the Developer making the side sewer of building sewer installation to verify the exact locations of all existing utilities prior to commencing any work. The Developer shall contact the utilities underground location center, 1-800-424-5555, a minimum of two (2) days prior to commencing work.

1.060 County Inspections

- A.** All side sewer and building sewer installation inspections and test Observations shall be made at Kitsap County Department of Public Works. The County Inspector shall be notified a minimum of two (2) working days in advance of commencing work on a sanitary sewer extension. Prior to final acceptance of all side sewer and building sewer installations in new sewer mains, the County shall conduct an inspection of the sewer mains by the use of television equipment. Final acceptance of side sewer and building sewer installations will not be made until tests and inspections are complete and prove satisfactory.

III-2.000 MATERIALS

2.010 General

- A.** The Developer shall submit information from the material manufacturer or fabricator showing that the materials meet the requirements of the design and pertinent specifications. The developer shall provide submittals to the County on all materials to be used.

2.020 Pipes and Fittings

- A.** Ductile iron pipe for gravity sanitary side sewer and building sewer pipe and pressure pipe shall conform AWWA C 151 Class 50 and shall be cement mortar lined, push-on joint, or mechanical joint. Joints for ductile iron pipe shall be rubber gasketed conforming to the requirements of AWWA C 111.
- B.** Side sewer and building sewer tee or wye fittings for ductile iron gravity pipes shall be rubber gasket push-on joint or mechanical joint ductile iron fittings. Saddles fastened to the sewer main with external bands shall not be accepted on any new system. Fittings shall have sufficient strength to withstand handling and load stresses normally encountered.
- C.** Fittings for ductile iron gravity and pressure pipe shall meet the requirements of AWWA C 110 or AWWA C 153. Fittings shall also be cement mortar lined, meeting the requirements of AWWA C 104.
- D.** Polyvinyl chloride (PVC) gravity side sewer and building sewer pipes shall conform to the requirements of ASTM D

3034, SDR 35 for pipe up to 15 inches diameter. Joints for PVC gravity sewer pipe shall be push-on types with restrained elastomeric ring gaskets conforming to ASTM D 3212. Rubber gaskets shall conform to ASTM F 477.

- E.** Side sewer and building sewer fittings for PVC pipes shall be made of PVC plastic having a cell classification of 12454-B, 12454-C, or 13343-C, as defined in ASTM D 1784. Fittings shall have sufficient strength to withstand handling and load stresses normally encountered.
- F.** Sanitary sewer forcemains for building sewers shall be a minimum of 1 ¼ inch diameter, Schedule 80 polyvinyl chloride (PVC) pipe.
- G.** Pressure pipe transition couplings, reducing couplings, transition-reducing couplings, and flexible couplings shall be compression type, constructed with ductile iron or steel sleeves and ductile iron followers. Bolts and nuts shall be ductile iron. Factory finish shall be the standard of the manufacturer. Couplings shall be Romac, Smith-Blair, or equal.

2.030 Side Sewer and Building Sewer Cleanouts

- A.** Cleanouts shall be constructed of the same material as the side sewer and building sewer and shall conform to the County Standard Details. Cast iron frame and covers for cleanouts shall be two bolt locking type, Olympic Foundry type M1025, or equal. Locking lids will be required on all 8-inch or larger main line cleanouts.

2.040 Bedding and Backfill

- A.** Foundation Material
- B.** Foundation material shall meet the requirements of Section 9-03.17, Class B, of the Standard Specifications for Road, Bridge, and Municipal Construction.
- C.** Bedding for Rigid Pipe
- D.** Unless approved otherwise for special cases, bedding material for rigid pipes shall conform to Standard Specifications for Road, Bridge, and Municipal Construction Section 9-03.15.

E. Bedding for Flexible Pipe

Unless approved otherwise for special cases, bedding material for flexible pipes shall conform to Standard Specifications for Road, Bridge, and Municipal Construction Section 9-03.16.

F. Check Dams

The design shall specify a check dam material of either native clay material, a mixture pipe bedding material and imported bentonite clay material, or control density fill material. Check dam materials approval by the County is required prior to construction.

G. Crushed Surfacing Top Course

Imported crushed surfacing top course shall meet the requirements of Section 9-03.9(3) of the Standard Specifications for Road, Bridge, and Municipal Construction.

H. Bank Run Gravel for Trench Backfill

Bank run gravel for trench backfill shall conform to Section 9-03.19 of the Standard Specifications for Road, Bridge, and Municipal Construction.

I. Control Density Fill

1. Control density fill material (CDF) shall be composed of portland cement, aggregate, fly ash, and water and shall conform to the following requirements:

a. Portland Cement: ASTM C 150, Types I or II

b. Aggregate: Sand with or without fine gravel, maximum size 1 inch. Aggregate shall be free of foreign material, roots, clay balls, trash, debris, and organics and shall have less than 15% finer than the No. 200 sieve. Material passing the No. 40 sieve shall be nonplastic.

c. Water (potable).

d. Fly ash: Class F ASTM C 618, unless otherwise approved.

- e. Admixture: As necessary to develop flowability without segregation.
2. CDF shall be proportioned to be a flowable, nonsegregating, self-consolidating, low shrink slurry with an unconfined compressive strength as specified below. The mix design shall be prepared for a range of aggregate gradations that are expected to be used. The Developer and its supplier shall determine the materials and proportions used to meet the requirements of these Specifications. The CDF mix for each strength class shall meet the flowability, pumpability, and set time requirements for each design application.
 3. No CDF shall be placed until the County has approved the mix design. The County's approval of the mix design will be understood to indicate conditional acceptance. Final acceptance will be based on tests conducted on field installations for conformance with these Specifications.
 4. With the County's approval, the Developer may be allowed the option of processing the native sands for CDF aggregate. If the Developer elects to use onsite sands for producing CDF, Developer shall make its own determination as to the quantity of suitable sand and amount of processing required and shall bear all costs associated with using native materials.
 5. Class 100 CDF shall have an unconfined compressive strength at 28 days of 100 psi, per ASTM D 4832, (+50 psi, - 20 psi). Maximum density 125 pcf.
 6. Class 300 CDF shall have an unconfined compressive strength at 28 days at 300 psi, per ASTM D 4832, (+100 psi, -50 psi). Maximum density 125 pcf.
 7. Class 1000 CDF shall have an unconfined compressive strength at 28 days of 1,000 psi, per ASTM D 4832, (+100 psi, -50 psi). Maximum density 125 pcf.

2.050 Miscellaneous

- A. Concrete thrust blocks for pressure force lines shall be Class B concrete poured in place, per County Standard Details.

- B.** Pipe anchors shall be constructed of Class C concrete with 1-inch diameter galvanized steel rod tie downs. The anchors shall be constructed per County Standard Details.

III-3.000 INSTALLATION

3.010 General

- A.** The Developer shall complete the proposed sanitary sewer construction in accordance with the approved construction drawings, details, specifications, state requirements, and local regulatory requirements.
- B.** The Developer shall provide all required staking and grades for the proper installation. No deviation shall be allowed without prior approval of the County. Staking shall be provided at the maximum of 50-foot intervals.
- C.** All existing sewer lines shall be kept in service at all times. Provision shall be made for disposal of sewage flow if any existing sewers are damaged. Damage to existing sewers shall be repaired by the Developer to a condition equal to or better than their condition prior to the damage. Water accumulating during construction shall be removed from the new sewers but shall not be permitted to enter the existing system. The Developer shall be responsible for flushing out and cleaning any existing sewers, into which gravel, rocks, or other debris has entered as a result of the work, and shall repair lift stations or other facilities damaged by the work at the Developer's expense.
- D.** Connection of a side sewer to an existing sewer main, where an in-line tee or wye is not available, will be made by the use of an approved saddle which will be furnished and installed by the County crews, once the Developer has exposed the sewer main and provided any shoring necessary to provide for safe working conditions, and upon the Developer obtaining the necessary permits.

3.020 Trenching

- A.** The maximum permissible trench widths in the pipe zone shall be according to the County Standard Details. If the maximum trench width is exceeded without authority of the County, the Developer shall provide pipe of higher strength classification or provide higher-class bedding, or as required

by the County. Above the pipe zone the trench may be any width.

- B.** The Developer shall provide all materials, labor, and equipment necessary to shore trenches to protect the work, existing property, utilities, pavement, etc., and to provide safe work conditions in the trench. The Developer may elect to any combination of shoring and overbreak, tunneling, boring, sliding trench shield, or other method of accomplishing the work consistent with applicable local, state, and federal safety codes.
- C.** Upon completion of work, the Developer shall remove all shoring unless indicated otherwise on the approved plans or as directed by the County. Damages resulting from improper shoring or failure to shore shall be the sole responsibility of the Developer.
- D.** The Developer shall furnish, install, and operate all necessary equipment to keep excavation above the foundation level free from water during construction, and shall dewater and dispose of the water so as not to cause injury to public or private property or nuisance to the public. Sufficient pumping equipment in good working condition shall be available at all times for emergencies, including power outage, and shall have available at all times competent workers for the operation of the pumping equipment.

3.030 Bedding

- A.** Bedding of the class or classes shown on the plans shall be installed in accordance with the County Standard Details. Bedding shall provide a uniform support along the entire pipe barrel, without load concentration at joint collars or bells. Bedding disturbed by pipe movement or by removal of shoring or movement of the trench shield or box shall be reconsolidated prior to backfill.
- B.** Bedding shall be placed in more than one lift. The first lift is to provide at least 4 inches of bedding under any portion of the pipe and shall be placed before the pipe is installed, and shall be spread smoothly so that the pipe is uniformly supported along the barrel. Subsequent lifts of the not more than 6 inches thickness shall be installed to a depth of 6 inches over the crown of the pipe. Each lift shall be

compacted to 90% of maximum density as determined by ASTM D 1557. Densities shall be determined by the sandcone method, ASTM D 1556 or by nuclear methods, ASTM D 2922.

3.040 Pipe Installation

- A.** The sewer pipe shall be laid up grade from point of connection on the existing sewer or from a designated starting point. The sewer pipe shall be installed with the bell end pointed upgrade. When pipe laying is not in progress the forward end other pipe shall be kept tightly closed with an approved temporary plug. A temporary plug shall be provided a point of connection to the existing sewer and shall not be removed until the new lines have been flushed, cleaned, tested and approved for use.
- B.** After an accurate grade line has been established, the pipe shall be laid in conformity with the established line and grade in the properly dewatered trench. Mud, silt, gravel, and other foreign material shall be kept out of the pipe and off the jointing surfaces. The invert line may vary from the true line and grade within the limits stated to develop uniformity, concentricity, and uniform compression of jointing material provided such variance does not result in a reverse sloping invert. The limit of the variance at the invert shall not exceed plus or minus 0.03 foot at the time of backfill. Line and grade shall be maintained with a laser beam operated by a qualified person. Checking of the invert elevation of the pipe may be made by calculations from measurements on the top of the pipe. Pipes with an invert variance greater than allowed shall be re-laid.
- C.** Where pipelines are to be laid on specified curves of sufficiently short radius to deflect the pipe joints in an amount greater than recommended by the manufacturer, the curves shall be achieved with a series of tangents and shop-fabricated bends, subject to the approval of the County.
- D.** Concrete thrust blocks for pressure lines shall be placed at bends, tees, dead ends, and crosses. Concrete thrust blocks shall bear against solid undisturbed earth at the sides and bottom of the trench.
- E.** The check dams shall be a minimum of 2 feet in length and keyed into the bottom and sides of the trench a minimum of

1 foot and extended 1 foot over top of pipe as per County Standard Details.

- F.** Sewer line connections to sewer mains, side sewers, or building sewers shall be left uncovered until after an acceptance inspection has been made by the County.
- G.** Pipe zone backfill for rigid pipe shall be imported crushed surface top course or control density fill.
- H.** Pipe zone backfill for flexible pipe shall be the same as the bedding material.

3.050 Cleanout Installation

- A.** Cleanouts shall be installed per Section III - 1.040 and County standard details. Cleanouts installed in areas to be paved shall be brought to grade level as per County Standard Details.
- B.** The side sewer 6-inch cleanout shall be brought to within 6-inches of finished grade plugged with a threaded plug and enclosed in a cast iron valve box with cover. See County Standard Details.
- C.** The building sewer cleanout shall be full building sewer diameter and shall be extended to a point not less than 6-inches or more than 12 inches below the finished ground surface and shall be plugged with a removable threaded watertight plug.

3.060 Backfill

- A.** The location of the end of side sewers shall be marked by the developer at the property line by a 2- by 4-foot wooden stake 4 feet long buried in the ground 3 feet. The lower end shall have a 2- by 4-foot cleat nailed to it to prevent withdrawal of the stake. The exposed 1-foot shall be painted white and the depth to the side sewer or tee indicated in black paint.
- B.** All trenching shall be completely backfilled as soon as practicable after inspection.
- C.** Adequate precaution shall be taken to insure proper compactness of backfill around piping without damage to such piping.

- D. Trenches shall be backfilled in layers no thicker than 8 inches to an elevation 12 inches above the top of piping with clean earth that shall not contain stones, boulders, cinderfill, or other material which would damage or break the piping or cause corrosive action.
- E. Fill shall be properly compacted and suitable precautions shall be taken to insure permanent stability for pipe laid in filled or made ground.

III-4.000 TESTING

4.010 General

- A. The County prior to backfilling shall inspect all side sewers. Any work that has been covered and which the County did not inspect shall be uncovered to allow inspections and testing.
- B. Persons authorized to complete the work shall be present during all inspection and testing.
- C. Notices of corrections or deficiencies shall be given at the time of inspection or written and delivered to the developer. All corrections and/or deficiencies noted by the County shall be corrected prior to scheduling a re-inspection.

4.020 Inspection

- A. Visual inspections shall be conducted on all alignment, grade, backfill, etc., and other items the County deems relevant. When an inspection is required on the weekend or holidays, the developer will be charged for the inspector's overtime.

4.030 Testing

- A. The side sewer shall be tested in its entirety or in sections as directed by the County.
- B. All side sewers constructed in conjunction with the sewer mains shall be tested by the low-pressure air method specified in Section II-4.040.

- C.** When side sewers and building sewers are not tested simultaneously with the test of the sewer mains, a test tee shall be installed at the first pipe out of the sewer main tee or wye branch so that a plug can be inserted for sealing off the side sewer for testing.
- D.** The test tees provided at all junctions of all building sewers with a side sewer shall be used to insert a plug to test the building sewer.
- E.** Water tests shall be completed by plugging the side/building sewer and filling with water to the point of overflow at the cleanout.
- F.** Water shall be kept in the side sewer for a minimum of 15 minutes. The system shall be watertight with no visual for measurable leakage.
- G.** An alternate to water testing is a standard air pressure test of 4 psi of pressure for a 5-minute period with no measurable loss of pressure.

4.040 Approvals

- A.** Upon the satisfactory testing and upon satisfactory evidence that all interior plumbing has been approved, the side sewer shall be approved for use and operation by the County and allowed to discharge into the County sanitary sewer system.