



SEWER LINE EXTENSION DESIGN CHECKLIST

SWLE# _____
 Utilities Staff _____
 Date _____

DISCLAIMER - This checklist is provided to Consulting Engineers for the express purpose of assisting them in compiling design plans for submittal to the Pierce County Public Works and Utilities Department. This checklist is merely a guide to assist the design engineer in providing the minimum information required for plan submittal. This checklist should be utilized in conjunction with the sewer line extension standard plans in completing your design. The complexity of your design may require additional information not included on this checklist. This checklist may be revised from time to time and the design engineer should insure that he/she has the most recent copy prior to compiling a design. If you have any questions regarding this checklist, please contact our office at (253) 798-4050.

This form has been completed by: _____ Date: _____
 (Form to be completed by the Consulting Engineer and included with plans on the initial submittal)

GENERAL INFORMATION

- | | <u>Done</u> | <u>N/A</u> | |
|-----|-------------|------------|-------------------------------|
| 1. | ___ | ___ | Project Name: _____ |
| 2. | ___ | ___ | Project Address: _____ |
| 3. | ___ | ___ | Engineer Name: _____ |
| 4. | ___ | ___ | Address: _____ |
| 5. | ___ | ___ | Phone/Fax: _____ |
| 6. | ___ | ___ | Owner Name: _____ |
| 7. | ___ | ___ | Owner's Contact Person: _____ |
| 8. | ___ | ___ | Address: _____ |
| 9. | ___ | ___ | Phone/Fax: _____ |
| 10. | ___ | ___ | Parcel No.(s): _____
_____ |

SUBMITTALS

- | <u>Done</u> | <u>N/A</u> | | |
|-------------|------------|-----|---|
| 11. | ___ | ___ | A five hundred dollar (\$500.00) non refundable deposit must be submitted along with the design plans for plan review and inspection. Check to be made out to Pierce County. Payment by credit card is not allowed. The proponent must submit a completed “Time and Material Billing Information” form with the non-refundable deposit. |
| 12. | ___ | ___ | Three (3) sets of plans are required for the initial submittal. Two (2) sets of plans are required for resubmittals. Once the plans are ready for approval, the Sewer Utility Division will require three (3) sets of plans, plus a reproducible original print (to be returned to the Applicant’s Engineer once the plans are approved). |
| 13. | ___ | ___ | Submit a complete, itemized, stamped Engineer’s Construction Cost Estimate for all the sanitary sewage facilities to be constructed within the existing public right-of-way and public sanitary sewer easements. |
| 14. | ___ | ___ | Once the County has accepted the itemized cost breakdown, and the plans have been approved, submit to this department a Performance Bond (or an Assignment of Funds in lieu of a Performance Bond) in the amount of one hundred (100) percent of the value of the improvements to be constructed within the existing public right-of-way and public sanitary sewer easements. |
| 15. | ___ | ___ | If there are off-site or on-site Public Sanitary Sewer Easements required, submit the name (and title, if the owner is a company) of the individual(s) empowered with signing easement documents for the property owner(s), and an electronic copy of the legal description of the easement and graphic drawing of the easement. The County will draft the easement document for the owner’s signature. Public easements shall be executed and recorded prior to plan approval. |
| 16. | ___ | ___ | If there are off-site or on-site Private Sanitary Sewer Easements required, submit the draft private easement documents for our review prior to execution and recording with the Pierce County Auditor’s Office. If the proposed private sewer line will serve more than one existing parcel, a draft Perpetual Reciprocal Easement, Mutual Maintenance Agreement and Covenant Running with the Land must be submitted for our review prior to execution and recording with the Pierce County Auditor’s Office. Only the standard Pierce County form is acceptable. The off-site private easements shall be executed and recorded prior to plan approval. |
| 17. | ___ | ___ | After the Applicant’s Engineer has received the first set of redline comments from the Sewer Utility Division, but prior to re-submittal of revised plans, the owner’s Engineer must contact the Supervisor of Development Engineering, Steven Chanfrau, at (253) 798-4129 to schedule a plan review conference. |
| 18. | ___ | ___ | If the Applicant proposes to enter into a Latecomers Agreement with the County in accordance with PCC 13.10, and the County agrees, the agreement must be executed after plan approval but before SWLE permit issuance. (Please see the “Latecomers Agreement Checklist” for additional submittal requirements.) |

Done N/A

19. If Critical Areas or Open Spaces are required as part of this project, the Area Charge fee for the property/development can be reduced by removing this area from the entire area to be developed in accordance with PCC 13.05.070.E
20. Will existing/proposed stubs serve all lots or structures by gravity? If not, grinder pump plans and specifications must be incorporated into the sewer line extension plans. A Residential Grinder Pump Design Checklist must also be submitted along with the required pump and force main calculations.

DRAFTING

Done N/A

21. Plans stamped, signed and dated by an Engineer licensed in the State of WA. Preliminary construction plans may only be stamped at the Engineer's discretion, however, these plans must also be stamped "Preliminary."
22. Plan size is 22" x 34" with sheets numbered consecutively (1 of 3, 2 of 3, etc.). Public and private sanitary sewers may be submitted in one application, but must be on separate plans.
23. Vicinity Map, identify project location on map, provide a north arrow and identify the scale used. Vicinity Map must include a major arterial (e.g., SR512, I-5, Canyon Road East, etc.)
24. Approval signature block in upper right hand corner. It shall be five (5) inches wide.
25. Place "Plan approval expires one (1) year from the date of approval" inside or under signature block.
26. Engineering scale and north arrow. North arrow must point to top, left or right of page.
27. Existing/proposed adjacent roads identified. Include existing/proposed edge of pavement, road centerline, utilities, shoulder ditch, etc. Clearly identify roads as public or private.
28. Project Description: Number of units/buildings/lots/seats/employees, etc. - identified on plans. Include the proposed use for each lot (SFR, Duplex, Mobile Home, etc.).
29. Scale 1" = 50' for all plats (private or public sewers) and public sanitary sewer systems. All other private sewer plans may be drawn at any legible engineering scale.
30. Color text and graphics are not allowed.
31. Minimum text height is 0.08 inches. Minimum line width is 0.005 inches. Smaller text and lines may be allowed if they are legible, able to be scanned, and are reproducible.

	<u>Done</u>	<u>N/A</u>	
32.	___	___	Hatching patterns (lines or dots) must be used in lieu of solid hatching.
33.	___	___	Show all existing/proposed sewer lines, manholes, stubs and easements on the plans. Label existing sewer lines as dashed line, and proposed sewer lines as solid lines. Identify the AFN for the recorded document that created the existing easement on the plan and submit a copy of the document.
34.	___	___	Show all existing and proposed manholes, cleanouts and sewer lines located on or adjacent to parcel shown. Existing and proposed private manholes must be named with the following convention: “SSMH (permit number)-##” For example, private manhole #4 of SWLE 409235 should be labeled as “SSMH #409235-04”. Letters are not allowed in the manhole numbering sequence (e.g., “SSMH #409235-4A”). Existing and proposed public manholes must be named with the following convention: “SSMH (Assigned number)” For example, public manhole #10983 should be labeled as “SSMH #10983”. Cleanouts should be labeled as “SSCO” instead of “SSMH”. Proposed public manhole numbers will be assigned by the plan reviewer after the proposed alignment has been approved.
35.	___	___	Length, type, size and slope of pipe shown on the profile view. The plan view must show the pipe diameter, length and type. Arrows that indicate the direction of flow must be provided at the manholes. Pipe lengths (and slopes) must be measured from inside wall of manhole to inside wall of manhole, not center-to-center.
36.	___	___	All existing/proposed utilities must be shown on plan and profile.
37.	___	___	Two foot contour intervals - show the existing and proposed topography for entire property. If the property is flat, provide spot elevations. If the plan requires a cover sheet, the exiting topography shall be shown on the cover sheet and the proposed topography shall be shown on the design sheets.
38.	___	___	Show and label all existing structures on site to remain or to be demolished. All plumbed buildings to remain must be connected to the existing or proposed sanitary sewer system in conjunction with the Sewer Line Extension (SWLE) permit. Connection charges for each building to remain must be paid under a separate Sewer Service Permit (SWSR) prior to, or at the time of issuance of the Sewer Line Extension permit.
39.	___	___	All public and private off-site easements and all public on-site easements must be recorded and their boundaries shown on the plans prior to plan approval. The Auditor’s Fee Number (AFN) for all easements must be shown on the as-builts prior to project acceptance.

- | | <u>Done</u> | <u>N/A</u> | |
|-----|-------------|------------|--|
| 40. | ___ | ___ | Pierce County Datum, location description and elevation shown on the plans. |
| 41. | ___ | ___ | Bearings and distances for all existing property lines. Show parcel number(s) and property lines of the existing parcel(s). Show adjacent parcel numbers and property lines. |
| 42. | ___ | ___ | All designs shall be on plan and profile sheet only. Separate plan sheets and profile sheets will not be accepted. Profiles must be aligned under the corresponding plan. |
| 43. | ___ | ___ | Show Standard Pierce County Public Works and Utilities construction notes for sewer line extensions on the plans. |
| 44. | ___ | ___ | Show the bearings and distances of existing or proposed sewers within existing or proposed easements as well as the easement boundaries. Label each existing parcel within the project boundaries with the parcel number and area in square feet. |
| 45. | ___ | ___ | De-emphasize storm sewer catch basins and pipes shown on the plan and profile views with labeling for CB stationing and numbering only. The profile view must also contain the catch basin rim and invert elevations, and pipe diameter(s). If clearance is an issue, pipe type may also be required to be shown. |
| 46. | ___ | ___ | Include a cover sheet (if necessary) showing entire property and location of improvements. Scale 1" = 100' for general plan layout on cover sheet. Clearly label existing and proposed manholes with manhole numbers. |
| 47. | ___ | ___ | Correct rim and invert elevations at point of connection must be field verified, prior to the submittal of the plans and shown on the plans as "existing." If connection is between two existing manholes, invert and rim elevations of upstream and downstream manholes are required as well as the distance of the proposed connection point from both the upstream and downstream manholes. Saddle manholes are not acceptable. |
| 48. | ___ | ___ | Provide invert "in" and "out" elevations, rim elevations, manhole diameter, stationing, offset, and special notes (i.e., "With Watertight Locking Lid") in the profile view for all manholes and cleanouts. Only stationing, offsets, manhole diameter, special notes and manhole numbers must be shown in the plan view. |
| 49. | ___ | ___ | Side sewer stub locations shall be shown on the plans and stationed from the nearest downstream manhole, or per the centerline of road stationing. A table may be used to consolidate the proposed stub location stationing, but a lot's stub location table must be shown on the same sheet as the lot. Even if a table is utilized, as-built locations of the stubs must be shown in the specified "bubble" format shown on the As-built Standard Plan. A minimum 1/2-inch diameter blank circle shall be provided on each lot as a placeholder for the as-built stub location ("bubble") information. |

DESIGN

	<u>Done</u>	<u>N/A</u>	
50.	___	___	0.06' drop between invert in and invert out of manhole (same size pipe) for GU lined manholes. Manholes placed over existing collector mains shall match the slope of the pipe. New connections to existing manholes with concrete channels shall have a 0.1' drop for similar diameter pipes.
51.	___	___	Where two dissimilar sewer line diameters meet at a manhole, use the 0.8 depth rule to determine the drop across the manhole: $\text{Invert Elevation}_{\text{out}} + (0.8 \times \text{Diameter}_{\text{out}}) - (0.8 \times \text{Diameter}_{\text{in}}) = \text{Invert Elevation}_{\text{in}}$ If the larger line is a sewer interceptor larger than 15 inches in diameter, then match crowns of the two pipes.
52.	___	___	Show 100-year flood plain on plans. All manholes shall be set a minimum of one (1) foot above flood plain elevation.
53.	___	___	Note the name of the licensed surveyor/engineer who provided the field topography on the plans. Include the date when the survey was completed.
54.	___	___	Manholes and cleanouts shall not be located in low point of vertical curves or curb flow lines. If no other location is possible, then watertight locking lids must be specified.
55.	___	___	Manholes and cleanouts located outside of paved areas require water tight locking lids and concrete collars.
56.	___	___	Straight vertical and horizontal alignment between manholes is required.
57.	___	___	Manholes installed at all changes in grade, alignment and pipe intersections. Manholes located on interceptor sewers 15" in diameter or larger, shall be required to have protective coatings installed per Pierce County Specifications.
58.	___	___	Drop connections: maximum height of the drop is 12 feet. Inside drops require a minimum of 54-inch diameter manhole and must have no conflict with the ladder location. An inside drop may be installed in an existing 48-inch diameter manhole at the County's discretion. Provide one (1) foot horizontal separation between the drop structure and ladder. One inside drop is allowed in a 54-inch diameter manhole. A 72- inch diameter manhole is required if two inside drop structures are proposed.
59.	___	___	The field verified location of the existing ladder must be shown at the point of connection into the existing manhole. If there is a conflict, the owner's engineer must identify on the plans how the problem will be resolved.
60.	___	___	On public and private systems, manholes are required at terminus of all sewer mains .
61.	___	___	Maximum distance between manholes is 350 feet.

Done N/A

62. ___ ___ Minimum diameter for sewer mains is 8 inches.
63. ___ ___ Provide calculations for all sewer mains at grades of less than 1% proving that a minimum self-cleaning velocity of 2 ft/sec can be obtained at full build-out of the project and/or tributary sewer basin. Over-sizing pipes to obtain lower minimum slopes is not acceptable. (For further information, see the “Calculation of Minimum Pipe Slopes to Obtain Self-Cleaning Velocities in Sanitary Sewers” handout.) Calculations must be stamped, signed and dated by an Engineer licensed in the State of Washington.
64. ___ ___ Proper location of all sewer manholes is 5 feet south and west of centerline of the public right-of-way or private road.
65. ___ ___ Provide a roadway restoration detail on the plans. Any proposed improvements in existing County roadways will be routed to PCPW&U-Transportation Services Division for their concurrence/requirements by the Sewer Utility’s Division staff. Limits of road restoration must be shown on the plan view.
66. ___ ___ Minimum cover over PVC pipe is 5 feet in driving areas and existing or proposed right-of-way, and 3 feet in non-driving areas. Ductile iron pipe (CL 52) may be substituted for PVC and the minimum cover reduced to 3 feet in driving or non-driving areas. Pipes with cover greater than 20 feet but less than 25 feet shall be PVC SDR21. Pipes with cover greater than 25 feet shall be DIP CL 52. Cover shall be measured from the top of pipe.
67. ___ ___ Any ductile iron pipe used must be Class 52 and lined per Pierce County Specifications. All sewers to be constructed in fill areas must use DIP. No transitioning to other pipe materials or classifications will be allowed between the manholes except as allowed for inside drop structures.
68. ___ ___ All utilities crossing sewer lines must have proper vertical clearance. The minimum vertical separation for PVC sewer pipe is 3 feet from water lines and 1.5 feet from all other utilities (separation shall be measured from the outer wall of the pipes). Concrete encasement or Class 52 ductile iron pipe shall be used where water mains cross with less than 3 feet clearance but not less than 1.5 feet, or other utilities cross with less than 1.5 feet clearance but not less than 0.75 feet. If the pipe is encased, it shall be encased 10 feet on each side of the crossing. If Class 52 ductile iron pipe is used for the sewer main, no transitioning to other pipe materials will be allowed between the manholes. Are there any side sewer conflicts with other utilities? Check for water lines, storm drainage systems to include percolation systems, utility vaults, etc.
69. ___ ___ Sewers on 20% slope or greater shall be anchored securely with concrete anchors. The engineer must provide details and calculations to justify sizing and spacing of pipe anchors.

	<u>Done</u>	<u>N/A</u>	
70.	___	___	Sewer main stationing must be tied to the stationing of the existing/proposed public right-of-way or private road. Stationing equations are required at all intersections. All station lines must be labeled with bearings and distances.
71.	___	___	Minimum side sewer depth at property lines is 5 feet for gravity systems. Lots that are questionable for gravity service shall indicate minimum finished floor elevations on the plans to insure that gravity service can be obtained. All side sewers shall be located a minimum of 10 feet from an adjoining property line unless adequate private sanitary sewer easements are provided. Side sewer depth at the property line shall not exceed 8 feet unless otherwise approved by the County.
72.	___	___	Gravity side sewer stubs shall have a minimum 2% slope.
73.	___	___	Manholes and side sewer stubs shall be located such that the stubs connect directly to the manholes wherever possible.
74.	___	___	Two (2) feet minimum horizontal separation is required between pressure side sewer stubs and gravity stubs on opposing sides of the sewer main. Ten (10) feet minimum horizontal separation is required between gravity side sewer stubs on the same side of the sewer main. Five (5) feet minimum horizontal separation is required between side sewer stubs and the outer wall of manholes unless the stub is connected to the manhole.
75.	___	___	Side sewer taps will not be allowed to existing interceptors 18 inches in diameter or greater. Parallel sewer lines will be required to provide service.
76.	___	___	Existing concrete manholes that are tapped for a force main connection shall have their interior receive protective coatings per Pierce County Specifications. New manholes that receive force main connections shall be HDPE.
77.	___	___	Parallel sewer and water lines must have ten (10) feet of horizontal separation (separation shall be measured from the outer wall of the pipes).
78.	___	___	Sewer pipes and manholes adjacent to and within a zone of influence of 1V:2H from the 100-year storm elevation of existing or proposed storm drainage retention ponds, the top of the permeable material in infiltration trenches, or wetlands shall be High-density Polyethylene (HDPE). Proposed HDPE manholes must be labeled with the interior angle between adjacent inlet and outlet pipes. In lieu of providing the interior angle information on the plan view, a separate manhole schematic detail may be added to the plans elsewhere.
79.	___	___	Trench dams placed near the downstream end of each off-site public extension and each on-site public or private extension and on the downstream side of any crossing of streams, wetlands, drainage ditches, storm drainage ponds, infiltration trenches, or any other man-made or natural feature which may introduce surface or ground water to the bedding or backfill of the sanitary sewer trench.

	<u>Done</u>	<u>N/A</u>	
80.	___	___	Stub material must match or exceed the mainline pipe material.
81.	___	___	The maximum number of inlet pipes to a manhole is five (5). The minimum allowable horizontal angle between the centerlines of two 6-inch sewer pipes connected to the same manhole with a fiberglass invert liner is 29 degrees. The minimum angle between a 6-inch pipe and an 8-inch pipe connected to the same manhole with a fiberglass invert liner is 36 degrees. For existing manholes with concrete channels, the minimum distance between the outside edges of pipes measured along the inside wall of the manhole is 1 foot. Minimum separation between pipes in HDPE manholes shall be per the manufacturer's recommendations.
82.	___	___	8-inch diameter stubs are required out of each proposed manhole at all public and private road intersections and where extensions may be required in the future. Stubs out of manholes must be at least as long as they are deep.
83.	___	___	Sewer main extensions shall be installed along the property's frontage at least as far as the road improvements required for the development.
84.	___	___	Paved access is required to all existing/proposed manholes. The maximum allowable grade for access roads is 15% (12% max. if pavement other than asphalt or concrete is approved by the County). Manholes must be within the paved surface and have a minimum paved area 6 feet square centered on the manhole lid. Standard turnarounds must be provided to access roads that are either: <ol style="list-style-type: none"> a. greater than 150 feet long, or b. have curved alignments and are greater than 50 feet long, or c. connect to Interstate Highways, State Routes or major or secondary arterial roads as defined by County Ordinance 2001 (or principal or minor arterials as defined by FHWA 2003 in incorporated areas) and are greater than 50 feet long.