

STANWOOD STREET AND UTILITY STANDARDS

CHAPTER 4

4.000 WATER

4.010 General

Any extension of the Stanwood Water System must be approved by the City and must conform to Washington State Department of Health guidelines, North Snohomish County Coordinated Water System Plan, City of Stanwood Comprehensive Water System Plan, and Stanwood Fire Department requirements.

In designing and planning for any development, it is the developer's responsibility to see that adequate water for both domestic use and fire protection is attainable. The developer must show, in the proposed plans, how water will be supplied and whether adequate water pressure and fire flows will be attained in case of fire. A hydraulic analysis of the system will be performed by the City to ensure necessary improvements are being provided.

Anyone who wishes to extend or connect to the City's water system shall contact the Community Development Department. The proposed extension/connection will be reviewed in the context of the applicable permit process for the proposed development and is subject to the submission requirements and fees, including connection and plant investment fees, for that process. The Community Development Department will coordinate the required review with other City Departments through the permit process.

Questions about existing service improvements, repairs or temporary water use should be directed to Public Works. Prior to the release of any water meters, all improvements must be completed and approved including granting of right-of-way or easements, and all applicable fees must be paid.

4.020 Design Standards

The design of any water extension/connection shall conform to City Standards and any applicable standards set forth herein.

The layout of extensions shall provide for the future continuation and/or "looping" of the existing system as determined by the City.

The General Notes on the following pages shall be included on any plans dealing with water system design.

4.030 Water Main Construction General Notes

1. All workmanship and material shall be in accordance with City of Stanwood standards and the most current copy of the State of Washington Standard Specifications for Road, Bridge, AWWA Standards, APWA and Municipal Construction.
2. A preconstruction meeting shall be held with the City prior to the start of construction.

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3. Water mains shall be ductile iron cement mortar lined thickness Class 52.
4. Gate valves shall be resilient wedge, NRS (Non Rising Stem) with O-ring seals. Valve ends shall be mechanical joint or ANSI flanges. Gate valves shall have stainless steel bonnet and gland bolts. Gate valves shall have electrostatically applied fusion-bonded epoxy-resin coating meeting or exceeding AWWA C550. Valves shall conform to AWWA C509 or C515. Gate valves shall be Mueller, M & H, AVK, or Waterous. Existing valves to be operated by City employees only.
5. Hydrants shall be M & H Reliant Style 929, or Clow F-2500 or Waterous Pacer. Hydrants shall be bagged until system is approved. Hydrants will come complete with Storz adapters.
6. All lines shall be chlorinated and tested in conformance with the above referenced specification (Note 1).
7. All water pipes and services shall be installed with detectable marking tape installed 18" above the pipe crown, or 12" below finished grade (whichever is deeper). Detectable marking tape shall conform to WSDOT/APWA Standard Specifications. In addition, all non-metallic pipes and services shall be installed with 14 gauge coated copper wire wrapped around the pipe, brought up with three feet of loose wire and tied off at valve body, meter box or as directed by the inspector. The contractor shall furnish and install the tape and wire.
8. Provide traffic control plan(s) as required in accordance with MUTCD.
9. All water mains shall be staked for grades and alignment by an engineering or surveying firm capable of performing such work.
10. All existing cement asbestos pipes shall be handled and disposed of according to State and Federal statutes.
11. Call Underground Locate at 1-800-424-5555 a minimum of 48 hours prior to any excavations.
12. The City will be given 72 hours notice prior to scheduling a shutdown. Shutdowns shall not occur on Mondays, Fridays, City holidays, or the day before or after a City holiday. Where connections require "field verification", connection points will be exposed by contractor and fittings verified 48 hours prior to distributing shutdown notices.
13. At any connection to an existing line where a new valve is not installed, the existing valve must be pressure tested to City standards prior to connection. If an existing valve fails to pass the test, the contractor shall make the necessary provisions to test the new line prior to connection to the existing system or install a new valve.
14. All water pipe and appurtenances shall be lead free in accordance with the Safe Drinking Water Act, Section 1417.

4.040 Main Line

- A. Water mains shall be sized to provide adequate domestic plus fire flow at minimum residual pressure of 20 psi. The quantity of water required shall not be less than as outlined in the Stanwood Comprehensive Water System Plan, unless adequate fire

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flow requirement calculations are provided. Maximum allowed velocity will be 8 feet per second.

- B. The minimum water main size shall be 8 inches diameter as long as fire flow requirements can be met. Larger size mains are required in specific areas outlined in the Stanwood Comprehensive Water System Plan. Nothing shall preclude the City from requiring the installation of a larger sized main in areas not addressed in the Comprehensive Water System Plan if the City determines a larger size is needed to meet fire protection requirements or provide future service.
- C. Where practical, mains shall be looped to increase reliability and fire flow capacity. Dead end 8-inch mains shall not be longer than 400 lineal feet unless approved modification pursuant to Section 1.055.
- D. For any new water main installation or replacement of any existing mains, a soil study to determine the corrosive properties of the soil within the project location shall be required at the developer's expense.
- E. If the City Engineer or designated representative determines soil conditions or other protection measures require PVC piping, then PVC pipe with 32#D5 Ultramag High Potential Magnesium anodes at all fittings shall be required. All pipes and fittings shall be fastened using stainless steel bolts.
- F. Except as required by section E above, all pipe for water mains shall have flexible gasket joints and shall be Ductile Iron Pipe. Ductile iron pipe shall conform to AWWA C 151 Class 52 and have a cement mortar lining conforming to AWWA C 104. Non-restrained joints shall be push-on type or mechanical joint, conforming to AWWA C 111.
- G. All fittings for ductile iron pipe shall be ductile iron fittings conforming to AWWA C 153. All shall be cement mortar lined conforming to AWWA C 104. All fittings shall be connected by flanges or mechanical joints.
- H. The maximum cover for all water mains from top of pipe to finish grade shall be 48 inches and the minimum cover shall be 36 inches, unless otherwise approved by modification pursuant to Section 1.055.4.050

Connection to Existing Water Main
The developer's engineer shall be responsible for determining the scope of work for connection to existing water mains.

It shall be the Contractor's responsibility to field verify the location and depth of the existing main and the fittings required to make the connections to the existing mains.

4.050 Service Interruption

The contractor shall give the City a minimum of 72 hours notice of any planned connection to an existing pipeline. This includes all cut-ins and live taps. Notice is required so any disruptions to existing services can be scheduled. The City will notify customers involved or affected by the water service interruption. The contractor shall make every effort to schedule water main construction with a minimum interruption of water service. In certain situations, the City may dictate scheduling of water main shutdowns so as not to impose unnecessary shutdowns during specific periods to existing customers.

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4.060 Hydrants

- A. The lead from the service main to the fire hydrant shall be ductile iron cement mortar lined Class 52 no less than 6 inches in diameter up to 50 feet in length. Over 50 feet in length shall be sized to meet the fire flow requirement.
- B. Fire hydrants shall have two, 2½-inch outlets and one 4½ inch pumper port outlet. All outport threads shall be National Standard thread. The valve opening shall be 5¼-inch diameter. The hydrant shall have a positive and automatic barrel drain and shall be of the “safety” or breakaway style. All hydrants shall have Storz fittings. Hydrants shall be M & H Reliant Style 929, Clow F-2500 or Waterous Pacer. All hydrants shall be bagged until system is approved.
- C. The Public Works Department and Stanwood Fire Department work together to ensure that adequate hydrant spacing and installation are achieved.

Unless otherwise required by the governing authority, the following guidelines shall apply for hydrant number and location.

- 1. At least one hydrant shall be installed at all intersections.
 - 2. Hydrant spacing of 600 feet shall be required in all areas servicing single family and duplex residential areas. All single family lots shall be within 300 feet from a fire hydrant, as measured along the path of vehicular access.
 - 3. Fire hydrants serving any use other than detached single family dwellings or duplex dwelling on individual lots will be located not more than 300 feet on center, and will be located so that at least one hydrant is located within 150 feet of all structures, but not closer than 50 feet, unless approved by the Stanwood Fire Department.
 - 4. Hydrants located in dead-end areas or cul-de-sacs shall service an area of no more than 120,000 square feet.
- D. For requirements regarding use, size and location of a fire department connection (FDC) and/or post indicator valve, contact Stanwood Water Department. Location of FDC shall be shown on water plans.
 - E. Where needed, the Public Works Department or Stanwood Fire Department may require hydrants to be protected by two or more posts, each 4 inches in diameter by 5 feet in height made of either reinforced concrete or steel.
 - F. Fire hydrants must be installed, tested, and accepted prior to the issuance of a building permit.
 - G. Fire hydrants shall be red and white with the body of the hydrant red and the caps and top white. Hydrants shall either be provided by the factory with the required color scheme or shall be painted by the developer with two coats anti-rust, oil base enamel.

4.070 Valves

All valves and fittings shall be ductile iron with ANSI flanges or mechanical joint ends. All valves shall have stainless steel bolts for bonnets and glands, approved by the manufacturer. All existing valves shall be operated by City employees only.

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Valves shall be installed in the distribution system at sufficient intervals to facilitate system repair and maintenance, but in no case shall there be less than one valve every 1000 feet. There shall be a minimum three valves on each tee and four valves on each cross. Specific requirements for valve spacing will be made at the plan review stage.

- A. Gate Valves, 2-inch to 12-inch. The design, materials and workmanship of all gate valves shall conform to AWWA C509 or AWWA C515, latest revision. Gate valves shall be resilient wedge non-rising stem (NRS) with two internal O-ring stem seals. Gate valves shall be Mueller, M & H, AVK, or Waterous.

Gate valves shall be used on all 2-inch to 12-inch lines.

- B. All valves larger than 12 inches shall be approved as determined by the Public Works Director. Butterfly valves shall be used on all lines 14 inches or larger.
- C. Valve Box. All valve boxes shall be cast iron per WSDOT/APWA Standards. In areas where valve box falls in road shoulder, the ditch and shoulder shall be graded before placing asphalt or concrete pad.
- D. Valve Markers. Valve markers shall be Carsonite CRM 08-66 utility markers or approved equivalent. Markers shall be 3 3/4-inch total width with a minimum length of 66 inches. Markers shall be blue and shall include a 3-inch x 3-inch hi-intensity white reflective sheeting, a Carsonite 116CW caution water valve decal, and a prong at the base to prevent pull-out.

4.080 Casing

Steel casing pipe shall be schedule 20 steel or equal. Pipe spacers shall be Calpico Model PX or equal with at least eight runners. Casing pipe and spacers shall be sized for pipe being installed. Install minimum of three spacers per section of pipe. Cap ends with end seals equal to APS Model Wrap Around End Seal.

4.090 Air and Vacuum Release Valve

Air and vacuum release valves (ARV) shall be per WSDOT Standard Plans. Air and vacuum release valve shall be equal to Apco 145C.

The installation shall be set at the high point of all water mains when required. Where possible, pipes are to be graded to prevent the need for an air release valve.

ARV valves shall be marked with Carsonite CRM 08-66 utility markers or approved equivalent. Markers shall be 3 3/4-inch total width with a minimum length of 66 inches and include a prong at the base to prevent pull-out. Markers shall be blue and shall be stenciled or affixed with the letter "V" and lettering indicating valve size and distance in feet and inches to the valve on the face of the marker. Such lettering shall be in permanent black marker, black paint, or black industrial decals and shall be 2-inches in height.

4.100 Blowoff Assembly

Blowoff assemblies shall be set at the low points and dead-ends of all water mains, unless a fire hydrant is located at the low point or dead-end of the water main.

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If a fire hydrant is not located at the end of a dead end main, a blowoff assembly shall be required. On water mains which will be extended in the future, the valve which operates the blowoff assembly shall be the same size as the main and provided with a concrete thrust block. The pressure rating for blowoff assemblies shall be 200 psi.

Blowoff assemblies shall be marked with Carsonite CRM 08-66 utility markers or approved equivalent. Markers shall be 3 3/4-inch total width with a minimum length of 66 inches and include a prong at the base to prevent pull-out. Markers shall be blue and shall be stenciled or affixed with the letters "BO" and lettering indicating distance in feet and inches to the blowoff on the face of the marker. Such lettering shall be in permanent black marker, black paint, or black industrial decals and shall be 2-inches in height.

4.110 Sampling Station

A sampling station, per the standard details, shall be installed in all new developments.

4.120 Backflow Prevention

The installation of all backflow devices is required to protect the existing water system and users from possible contamination.

The Stanwood Public Works will monitor the test of the fire line and obtain the certificate for underground piping. The fire line portion of the underground piping will not be tested until the Public Works Department has tested and approved their main up to the fire line.

4.130 Service Connection

- A. All service connections relating to new development shall be installed and tested by the developer at the time of mainline construction. Testing shall include main and service line up to meter setter. After the lines have been constructed, tested, and approved, the owner may apply for a water meter. The City will install a water meter after the application has been made and all applicable fees have been paid. Water meters will be set only after system is inspected and approved.
- B. When water is desired to a parcel fronting an existing main but not served by an existing setter, an application must be made to the City. Upon approval of the application and payment of all applicable fees, the applicant will tap the main, and install the meter box, and setter. The City will inspect and approve the installation and then install the water meter.
- C. Service lines shall be 1 inch IPS high density polyethylene pipe, minimum pressure class 200 psi per WSDOT/APWA Standards. No glued joints will be accepted. Service lines shall be installed 22.5 degrees off the main. Tracer tape and fourteen gauge coated copper wire wrapped around the pipe shall be installed on all service lines.

Service saddle shall be all bronze with stainless steel straps and shall be Romac style 202S or approved equal. All clamps shall have rubber gasket and iron pipe threaded outlets.

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Corporation stop shall be all bronze and shall be Ford type F1101, with ribbed insert brass only or approved equal with iron pipe threads conforming to AWWA C 800. Stainless steel inserts shall be used with pack joints and polyethylene pipe.

- D. An approved backflow prevention system must be installed in conjunction with any master meter. Master meters will not be allowed for service to more than one per building. Mixed-use buildings shall have separate meters for residential service and commercial service. Commercial service shall have separate meters for the different classifications of commercial users. All meters shall be owned, operated and maintained by the City of Stanwood.
- E. Individual pressure reducing valves shall be installed on all service connection lines where the distribution line static pressure is 80 PSI or greater. Pressure reducing valves shall be installed between the meter and building (typically installed inside the building). Such individual pressure reducing valves shall be owned, operated and maintained by the building or home owner.

4.140 Water Main/Sanitary Sewer Crossings

The contractor shall maintain a minimum of 18 inches of vertical separation between the crown of sanitary sewers and the bottom of water mains. The minimum horizontal separation shall be 10 feet.

The longest standard length of water pipe shall be installed so that the joints will fall equidistant from any sewer crossing. In some cases where minimum separation cannot be maintained, it may be necessary to encase the water pipe and/or sewer service in pipe or concrete. The casing shall extend a minimum of 10 feet on either side of the crossing. No concrete shall be installed unless specifically directed by the City.

The contractor shall comply all other requirements identified in the *Criteria for Sewage Works Design* prepared by the Department of Ecology, October 2006 Edition, Chapter C1, Section C1-9.

4.150 Irrigation

All irrigation systems shall be installed with an approved backflow prevention assembly approved by AWWA and the Snohomish County Health District. The minimum required is a double check valve assembly.

Irrigation sprinklers shall be situated so as to not wet any public street or sidewalk.

4.160 Staking

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The engineer or surveyor directing such work shall be licensed as a Professional Engineer or Professional Land Surveyor by the State of Washington.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

The minimum staking of waterlines shall be as directed by the City Engineer or as follows:

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- A. Stake centerline alignment every 50 feet with cut or fill to invert of pipe maintaining a minimum cover required over pipe. Cuts are normally not required when road grade has been built to subgrade elevation.
- B. Stake alignment of all fire hydrants, tees, water meters, setters and other fixtures and mark cut or fill to hydrant flange finished grade.

4.170 Trench Excavation

- A. Clearing and grubbing where required shall be performed within the easement or public right-of-way as permitted by the City and/or governing agencies. Debris resulting from the clearing and grubbing shall be disposed of by the owner or contractor in accordance with the terms of all applicable permits.
- B. Trenches shall be excavated to the line and depth designated by the City to provide a minimum of 36-inches of cover over the pipe. Except for unusual circumstances where approved by the City, the trench sides shall be excavated vertically and the trench width shall be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency. The trench shall be kept free from water until joining is complete. Surface water shall be diverted so as not to enter the trench. The owner shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out.
- C. The contractor shall perform all excavation of every description and whatever substance encountered and boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth of 6 inches below water main grade. Where materials are removed from below water main grade, the trench shall be backfilled to grade with material satisfactory to the City and thoroughly compacted.
- D. Trenching and shoring operations shall not proceed more than 100 feet in advance of pipe laying without approval of the City, and shall be in conformance with Washington Industrial Safety and health Administration (WISHA) and Office of Safety and Health Administration (OSHA) Safety Standard.
- E. The bottom of the trench shall be finished to grade with hand tools in such a manner that the pipe will have bearing along the entire length of the barrel. The bell holes shall be excavated with hand tools to sufficient size to make up the joint.

4.180 Thrust Blocking

Location of thrust blocking shall be shown on plans. Thrust block concrete shall be Class 3000 poured against undisturbed earth. A plastic barrier shall be placed between all thrust blocks and fittings.

4.190 Backfilling

Backfilling and surface restoration shall closely follow installation of pipe so that not more than 100 feet is left exposed during construction hours without approval of the City. Selected import backfill material shall be placed and compacted around and under the water mains by hand tools to a height of 6 inches above the top of the water main. The remaining backfill

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shall be select material and shall be compacted to 95 percent of the maximum density in traveled areas, 90 percent outside traveled areas. The use of native material for backfill shall only be allowed outside of the road section and as approved by the City. Where governmental agencies other than the City have jurisdiction over roadways, the backfill and compaction shall be done to the satisfaction of the agency having jurisdiction. All trench backfill material placed in any traveled way shall conform with WSDOT/APWA Standards for backfilling the trench.

4.200 Street Patching and Restoration

Requirements regarding street patching and trench restoration shall be per WSDOT/APWA Standards, the Transportation Chapter of these standards, and specific requirements of agency with jurisdiction.

4.210 Hydrostatic Tests

Prior to the acceptance of the work, the installation shall be subjected to a hydrostatic pressure test in accordance with WSDOT/APWA Standards. No main shall be hydrostatically tested until the lines are flushed of chlorine. The main shall be tested between valves. Insofar as possible, no hydrostatic pressure shall be placed against the opposite side of the valve being tested. Test pressure shall be maintained while the entire installation is inspected.

The contractor shall provide all necessary equipment and shall perform all work connected with the tests. Tests shall be made after all connections have been made and the roadway section is constructed to subgrade. This is to include any and all connections as shown on the plan. The contractor shall perform the test to assure that the equipment to be used for the test is adequate and in good operating condition and the air in the line has been released before requesting the City to witness the test.

4.220 Disinfection and Flushing

Disinfection of water mains shall be accomplished by the contractor in accordance with the requirements of WSDOT/APWA Standards and the Snohomish County Health District in a manner satisfactory to the City. At no time shall chlorinated water from a new main be flushed into a body of fresh water. This is to include lakes, rivers, streams, drainage ways, and any and all other waters where fish or other natural water life can be expected.

When a chlorine concentration has been established throughout the line, the valves shall be closed and the line left undisturbed for 24 hours. The line shall then be thoroughly flushed to a location approved by the City and water samples taken by the City at least 24 hours after flushing and disinfecting for approval by the local health agency. Should the initial treatment result in an unsatisfactory bacteriological test, the original chlorination procedure shall be repeated by the contractor until satisfactory results are obtained. The sample can only be taken on Mondays, Tuesdays, Wednesdays, and Thursdays until noon. Testing and sampling shall take place after all underground utilities are installed and compaction of the roadway section is complete.

Polypigging is required for flushing 12-inch and larger water mains. Mains that are polypigged shall be chlorinated after the pigging process is complete.