

TABLE OF CONTENTS

SECTION 400 – WATER SYSTEM STANDARDS	400-1
401 GENERAL CONDITIONS	400-1
402 SPECIAL CONDITIONS	400-3
403 MINIMUM FIRE FLOW REQUIREMENTS.....	400-4
404 MAXIMUM HYDRANT SPACING BASED ON MINIMUM FIRE FLOW REQUIREMENTS	400-4
405 NUMBER OF HYDRANTS FOR BUILDING PERMIT APPROVAL.....	400-5
406 MATERIALS AND INSTALLATION	400-5
406-1 ENGINEERING SPECIFICATIONS.....	400-5
406-2 MATERIALS	400-5
407 METHODS OF CONSTRUCTION	400-11

SECTION 400 – WATER SYSTEM STANDARDS

401 GENERAL CONDITIONS

1. Method of Extensions: Extensions (a) may be constructed by the City and financed by means of assessments against the property benefited within the limits of the Utility Local Improvement District formed for this purpose, or (b) may be constructed by the property owner or Developer in accordance with these regulations. No extension of the City's system by owner or Developer will be permitted until all applications and permits required hereunder have been approved by the City and all provisions of the City's regulations concerning such extensions have been fulfilled.

Extensions shall be designed and sized to service all adjacent areas. Extensions will be installed to the "far" property line(s) to provide access to future development, as determined by the City. Extensions shall be installed within public rights of way, tract areas that will be dedicated to the City or easements that will be granted to the City and are consistent with the requirements in Section 300. The City shall reserve the right to determine where easements will be provided in lieu of tract areas.

2. Annexation: Territory adjacent to the City's water service area, which is not already served by another water utility, may be annexed in accordance with State law. Information regarding annexation procedures will be furnished upon request.
3. Procedural Notes:
 - a. At the time that the preliminary proposal is submitted to the City, a letter requesting the availability of water should be submitted to the City for approval. A map showing the area to be served should accompany this request.
 - b. Prior to the design review of water mains, a Developer's Agreement for Water Main Extensions must be signed by the Developer and approved by the City Council. The Agreement should be accompanied by an application fee in the amount as set forth by current City ordinance. After the agreement is approved by the City Council, the Developer may authorize his/her consulting engineer to proceed with design and furnish the City six copies of the preliminary drawings. After review and approval by all applicable agencies the Developer's engineer shall provide six copies of the final water system extension design to the City. Drawing standards shall be as described in Section 200.
 - c. It is required that the Developer secure the appropriate bonds as described in Section 300, and that Washington State licensed and bonded contractors be employed by the Developer.
 - d. The City shall be notified at least five (5) working days in advance of start of work. The City at this time may require a preconstruction conference. Any work that is performed without proper notification of the City may be summarily rejected.
 - e. During the progress of the work, the City shall be kept informed and inspection will be required. The City will determine the amount of inspection required and the Developer shall pay all costs incurred during said inspection as specified in Sections 200 and 300.

- f. Testing of improvements is required by the City as specified herein. The Developer shall be required to reimburse the City for all costs related to conducting tests including the cost of testing laboratories.
 - g. All fees shall be paid prior to ordering meters. This includes cut-in fees, engineering fees, inspection fees and connection charges that might be applicable.
 - h. The Developer shall furnish the City with all necessary As-Built Drawings prepared as specified in Section 300.
 - i. The Developer shall furnish the City with a detailed cost break-down showing the total cost of construction.
 - j. The Developer shall furnish the City permanent executed and recorded easements that are necessary or applicable to this installation. The easements shall be as specified in Section 300.
 - k. The Developer shall furnish to the City a Maintenance Bond as described in Section 300.
 - l. Any areas where excessive pressure exists (in excess of 80 pounds per square inch) the Developer is responsible for the installation a “regional” PRV station. The City will have sole and exclusive discretion in the determination of need for said PRV stations.
 - m. After acceptance of the Water System by the City, the Developer shall promptly sign a Bill of Sale (in format approved by City) deeding these improvements to the City.
4. Notification Required: Notification by the applicant shall take place in writing to the City Engineer:
- a. Five (5) working days prior to starting construction or any excavation.
 - b. Three (3) working days prior to any cut-in.
 - c. Five (5) working days prior to final inspection and acceptance.
 - d. Provide coordination with any other contractors or utilities, which may be affected by the extension construction, including proper notification of the “one-call” locating service prior to construction.
 - e. Complete the work, including cleanup, to the point where the work complies with the plans and specifications, and is ready for acceptance by the City within the time limit provided.
 - f. The City will notify customers (written “door” notification) of any water shutdown at least 24 hours in advance of scheduled shutdown.
5. Review and Approval Fees: The fee for service shall be on a time- and expense-basis. The Developer will be invoiced for actual costs incurred in the project review and approval process by the City of Bonney Lake, plus an additional amount to cover administrative and accounting costs as allowed under the Bonney Lake Municipal Code. The City will not give final approval of the improvements until all fees are paid. Review and approval fees for Developer Extensions cover the following:

- a. Preapplication conference with the City Engineer on schematic drawings, as may be required/desired by the Developer and/or City.
 - b. Review of final design by the City Engineer of extensions granted preliminary approval.
 - c. Inspection and approval of the work in progress.
 - d. Inspection and approval of pressure tests.
 - e. Review and approval of Record Drawings.
 - f. Taking and submitting water samples for bacteriological test(s).
 - g. Legal review as necessary.
 - h. Other work necessary to assure compliance with City standards.
6. System Development Charge: The City presently has a system development charge for installation of meters for new water services. These fees are as currently established by the City Council and must be paid prior to meter installation and activation of the water service.
 7. Late Comers Agreement: The City may enter into an agreement for reimbursement with the Developer, upon request, for those properties that can be served from the construction of a water extension that are not a party to this Agreement. The reimbursement will be in accordance with the current policies of the City.

All review(s), approval(s), and fees associated therewith, as may be required or solicited by the City in regard to planning, design, and/or construction of said extension, modification, connections, or revisions to the City system shall be assessed to the developer/proponent and such reasonable costs shall be promptly paid to the City upon receipt of said billing by the City prior to permits and/or approvals being granted by the City as may be applicable.

402 SPECIAL CONDITIONS

1. Grade and Alignment: The water main shall be installed on the ground or roadway rough grade with 42 inches minimum cover. The notice by the Developer to the City that the ground or roadway is ready for water main installation shall be considered a representation that the Developer has brought the ground or roadway to grade or subgrade, and that he intends no further grading work. Any modifications of the main or appurtenances required to adjust to grade changes shall be at the Developer's expense. If the Developer contemplates off-roadway grading after installation of the water main that will affect the setting of fire hydrants or other appurtenances, he shall so state in writing prior to the installation of the main. Any adjustments required by such grading shall be at the Developer's expense.
2. Cross Connection Control: Washington State Department of Health (DOH) regulations with regard to the protection of the public through the provisions of minimum requirements for design, construction, operation and maintenance of public water supplies are adopted herein by reference, and all applicants shall comply with such requirements and standards. Developers shall familiarize themselves with these regulations and insure compliance with to protect the public health. These referenced regulations and standards are minimum, and the City specifically reserves the right to

require additional safety features and items as may be deemed appropriate by the City's Public Services Department.

3. Pressure Reducing Valves (PRV), Pressure Relief Valves, and Pressure Reducing Stations: There are two uniform plumbing codes. One is prepared by the International Association of Plumbing and Mechanical Officials; another is prepared by the International Conference of Building Officials. Both codes require installation of pressure reducing systems in the water system when static pressures exceed 80 psi. As a general rule, a PRV station as detailed herein will be required.
4. System Valves: System valves shall be installed at intervals of no more than 1,200 feet.

403 MINIMUM FIRE FLOW REQUIREMENTS

<u>Type of Development</u>	<u>Minimum Fire Flow Required (gpm)</u>	<u>Minimum Duration (Minutes)</u>
One and Two Family	1,000	45
Multi-Family	2,500	120
Commercial	2,500	120
Industrial	3,500	180

Flows shown above are minimum flows only for main extensions required for land development. Actual fire flow requirements for building permit approval/acquisition within the City of Bonney Lake shall be in accordance with Appendix B, Fire-Flow Requirements for Buildings, of the International Fire Code, currently adopted edition. Actual fire-flow requirements for building permit approval/acquisition shall be determined in accordance with Pierce County Code 15.12.083 when application is made for a County Building Permit.

1. Dead-end mains without domestic services will not be allowed unless otherwise approved by the City Engineer.
2. Dead-end water main extensions that exceed the length of 150 feet or that serve more than 15 single-family homes or 15 multi-family units will not be permitted unless otherwise approved by the City Engineer.
3. Unless deemed impractical by the Public Services Department, transmission and distribution mains shall be looped to provide reliability and fire flow capacity requirements and not to exceed maximum flow velocities.
4. Looping around large commercial or multi-family buildings shall be required and must meet Building Code and Fire Department fire hydrant building coverage. Looping shall be to and from a transmission main, unless otherwise approved by the City Engineer. In most cases, transmission mains will be defined as water mains greater than 8 inches in diameter.
5. The minimum diameter of distribution mains shall be 8 inches. All water mains will be ductile iron pipe, unless otherwise approved by the Public Services Department.
6. All new transmission mains shall be sized based on hydraulic analyses conducted by the City or its representative.

7. All new mains providing fire flow shall be sized to provide the required fire flow at a minimum residual pressure of 20 psi and maximum pipeline velocity of 8 fps during Max Day Demand (MDD) conditions. In general, new water mains that will carry fire flow in residential areas shall be a minimum of 8 inches in diameter and looped. New water mains in commercial, business park, industrial, and school areas shall be a minimum of 12 inches in diameter and looped.

404 MAXIMUM HYDRANT SPACING BASED ON MINIMUM FIRE FLOW REQUIREMENTS

<u>Type of Development</u>	<u>Maximum Spacing Between Fire Hydrants</u>
One and Two Family	600
All Others	300

1. Hydrants shall be provided along adjacent public and private roads. The location of fire hydrants shall be approved by the Fire Marshal and the City Engineer prior to installation. When practical, hydrants shall be located at street intersections.
2. In areas designated for one- and two-family development, fire hydrants shall be provided along adjacent public and private roads in such a manner as no lot is more than 400 feet (as measured from the center of the lot) from hydrant. In areas designated for all other types of development, fire hydrants shall be provided along adjacent public and private roads in such a manner as no lot is more than 300 feet (as measured from the center of the lot) from a fire hydrant.
3. Unless otherwise approved by the City, where streets are provided with median dividers or where arterial streets are provided with three or more traffic lanes and have a traffic count of more than 12,000 per day, fire hydrants shall be provided along both sides of adjacent public roads. Maximum hydrant spacing shall be in accordance with this section and shall be arranged on alternating basis.
4. Hydrants shall be supplied by 8 inch or larger water mains. Hydrants may be supplied by 6-inch water mains only if the main is less than 50 feet in length and if the main is part of an existing loop. In no case shall any hydrant be supplied by any water main smaller than 6 inches in diameter.

405 NUMBER OF HYDRANTS FOR BUILDING PERMIT APPROVAL

The number of fire hydrants required for the approval/acquisition of building permits shall be determined by the required fire flow for the building per Appendix B of the International Fire Code and the maximum spacing requirements outlined in Section 404. A minimum of one fire hydrant shall be provided for every 1,250 gallons per minute (gpm) of required fire flow or fraction thereof.

406 MATERIALS AND INSTALLATION

406-1 ENGINEERING SPECIFICATIONS

All work shall be constructed in conformance with the most current *Standard Specifications for Road, Bridge and Municipal Construction* and current amendments thereto, State of Washington revised as to form by the APWA Supplement to make reference to Local Governments, herein referenced to as “Standard

Specifications” and the “Conditions and Standards” as adopted by the City, shall be included as part of the “Specifications.” Where the Standard Specifications and the “Conditions and Standards” conflict with one another, the “Conditions and Standards” shall take precedence.

406-2 MATERIALS

1. General: The type or class of materials to be used shall be as shown on the project plans reviewed and approved by the City. Where no specific reference is shown, the following specifications shall govern the materials used. All materials shall be new, lead free, and undamaged, of a known brand, with replacement parts readily available from the general Seattle/Tacoma area.

Prior to the installation of any facilities required for the project, all materials shall be approved by the City.

All reference specifications herein shall be of the latest revision.

2. Ductile Iron Pipe: The class of ductile iron pipe shall be Class 53 for 4-inch pipe and Class 50 for 6-inch and larger diameter pipe. Six-inch hydrant spools shall be Class 53.

The pipe shall have a nominal inside diameter of the size indicated on the City-approved Plans or as otherwise stated herein. All ductile iron pipe shall be push-on or mechanical joint. All pipe shall be of one manufacturer and be carefully installed in complete compliance with the manufacturer’s recommendations and these Specifications. The City shall approve the manufacturer of ductile iron pipe. Preapproved manufacturers are:

- Pacific States Cast Iron Pipe Company
- Griffin Pipe Products Co.
- United States Pipe and Foundry Company

When necessary, water mains to be constructed under other utilities shall meet the minimum cover requirements. Where it is necessary to cross sanitary sewer or storm drain trenches, all trench backfill shall be removed and replaced with mechanically compacted granular material to provide a uniform support for the full length of the pipe.

The DOH requires a 10-foot horizontal separation between all sanitary sewer lines and water mains. A 5-foot horizontal separation is required between all water facilities and underground power, telephone, and other similar-type facilities. These dimensional separations shall be adhered to unless otherwise approved by the City.

Service Line Materials:

- a. Unless otherwise approved by the City Engineer service line material shall be per the standard details.

3. Fittings

- a. Ductile Iron Fittings: Fittings for ductile iron pipe shall be ductile iron or Class 250 gray iron conforming to AWWA C110 and C111, and shall be cement-mortar lined conforming to AWWA C104 (ANSI Standard A21.4).

Rubber gaskets for push-on (Tyton) or mechanical joint (M.J.) in accordance with ANSI Standard A21.11 (AWWA C 111).

- b. Transition, Reducing and Flexible Couplings: Couplings for steel pipe or asbestos cement pipe shall be Smith Blair or Romac. Couplings for cast iron pipe, ductile iron pipe, and PVC pipe shall be long-pattern sleeve mechanical joint.

4. Tapping Tee and Tapping Valve: Tapping tees shall be as specified in the standard plans.
5. Casing (Main Line): Welded steel pipe casing shall meet or exceed ASTM Designated A53 or comparable. Minimum wall thickness shall be determined by the city depending on local conditions and applications. Casing spacers and end seals (Cascade or owner-approved equivalent) shall be installed per the manufacturer's recommendations.
6. Fire Hydrants: Fire hydrants shall be a breakaway type and conform to AWWA Standard C502-73 and be one of the following types: Clow (Medallion), Waterous (Pacer), M&H (929), American AVK (Series 2780), or Mueller (Centurion).

They shall be non-rising stem compression-type which open counter-clockwise, and close with pressure. The main valve opening diameter shall be 5-1/4 inches, and the hydrant barrel shall have a diameter of 7 inches unless otherwise specified. The hydrant seat and hydrant seat retaining ring shall be bronze. All external bolts, nuts and studs shall be cadmium plated in accordance with ASTM A165 Type HS or rust proofed by some other process approved by the City. Gaskets shall be of rubber composition. Stortz adaptors are required on all fire hydrant assemblies.

The fire hydrants shall be painted with two (2) coats of rust inhibitive enamel paint, white in color or as specified by the City. See the standard details for additional specifications.

Fire hydrants shall be set as shown in the standard details.

No tool other than an approved hydrant operating wrench shall be used when opening or closing hydrant. Existing hydrants shall not be operated by the Contractor.

7. Gate and Ball Valves: Valves, 2 inches through 16 inches, shall be gate valves and conform with the requirements of AWWA Standard Specifications for gate valves for ordinary water works Service Number C 500 and C 509, except where superseded by the following:
 - a. They shall be iron body with epoxy coating inside and out with vulcanized resilient rubber wedge seat. The valves shall be non-rising stem, open to the left, and shall be equipped with standard 2-inch-square opening nuts. Valves shall be equipped with "O ring" packing. Valves shall be M&H, Waterous, Clow or Mueller.
 - b. Gate valves shall be set in the ground vertically and shall be opened and shut under pressure to check operation and, at the same time, show no leakage. Valves 6 inches and larger that are not flanged to other fittings shall be blocked in accordance with the standard plans.

8. Butterfly Valves: All valves larger than 16 inches shall be butterfly valves. Butterfly valves shall be Class 150 or better, either M&H 450 or 4500 or Pratt, and shall meet the requirements of AWWA C-504-70.
 - a. Valve shafts shall meet or exceed the strength requirements of AWWA C-504-70 and be one piece. Packing shall be “O ring” or other design approved by the City.
 - b. Butterfly valves to be installed underground shall have sealed mechanical operators, open to the left and have 2-inch standard square operating nuts.
 - c. Complete manufacturer’s specifications for the valves proposed for use shall be submitted to the City for approval. No valves shall be used which have not been approved by the City.
 - d. Butterfly valves shall be installed and tested in the same manner as gate valves. The Contractor is cautioned to test Butterfly Valves in strict compliance with manufacturer’s recommendations. Test pressure may need to be adjusted accordingly.
9. Blow-Off Assembly: Installation and materials for blow-off assemblies shall be as shown on the standard plans. Blow-offs shall be installed at all dead ends and when directed by the City at low points in the water distribution system. The City shall determine the appropriate size of blow-off assemblies.
10. Air and Vacuum Release Assembly: Air and vacuum release assemblies shall be sized and approved by the City Engineer and installed as shown in the standard details. Location of air and vacuum release valves shall be at localized high points of the system. Where required by the City’s Engineer, the vertical alignment of the new main shall be designed to alleviate the need for these types of valve assemblies at “localized” system high points.
11. Valve Boxes: Valve boxes shall be set flush in pavement with concrete collars. In gravel shoulder and in unimproved roadway areas, install a protective asphalt pad as shown in standard plans. Valve boxes shall be installed as shown in the standard plans.
12. Valve Stem Extensions: Installation and materials for the valve stem extensions shall be as shown on the standard plans.
13. Concrete Marker Posts: Concrete marker posts shall be 4 inches minimum square section and a minimum of 42 inches in length, with beveled edges and continuing at least one 3/8-inch by 37-inch bar of reinforcing steel. Paint shall be as for fire hydrants. Marker posts shall only be installed in approved locations as determined by the City.
14. Locating Wire: Locating wire shall be required for all non-metallic pipe materials. Installation and materials for locating wire shall be as shown on the standard details. Continuity testing shall be completed as required by the City.
15. Meter Boxes: Installation and materials for meter boxes shall be as shown on the standard details.
16. Ballcorp Corporation Stops: Installation and materials for water service ballcorp corporation stops shall be as shown on the standard details.

17. Service Saddles: Installation and materials for service saddles shall be as shown on the standard details.
18. Meters: Meters shall be per the City of Bonney Lake.
19. Asphalt Concrete Pavement Repair: See Section 600.
20. Concrete Blocking: Installation and materials for concrete blocking shall be as shown on the standard details.
21. Copper Pipe
 - a. Copper tubing shall be in accordance with ASTM B88.
 - b. Tubing shall be type K, seamless, and annealed.
 - c. Sizes 1 inch and below shall be soft drawn design. Sizes larger than 1 inch shall be hard drawn design.

Wall Thickness

- a. 3/4 inch and 1 inch tubing shall have a wall thickness of 0.065 inch.
- b. 2 inch shall have a wall thickness of 0.083 inch.

22. Brass Pipe, Fittings, and Valves

Brass Pipe

- a. Brass Pipe in accordance with ASTM B43, entitled "Seamless Red Brass Pipe, Standard Sizes".
- b. Brass pipe furnished shall conform to the standard dimensions, weights, and tolerances as shown in Table 1 of ASTM B43 for "regular" weight pipe.

Certification

- a. Testing and certification of results shall be prepared by the manufacturer in accordance with the ASTM Specification for each of the categories being bid. In addition, mill test reports for the brass pipe in accordance with ASTM B43 shall be provided.

Composition

- a. Material composition shall be copper alloy UNS No. C23000. The pipe shall be furnished in accordance with the quantities listed in Schedule A, be of "regular" weight and be furnished in 12 foot lengths unless otherwise noted. The chemical requirements shall be as follows:

<u>Element</u>	<u>Composition</u>
Copper	84.0-86.0%

Lead	0.05% maximum
Iron	0.05% maximum
Zinc	Remainder

- b. Pipe shall be furnished in the annealed condition to Standard No. "O 61" in accordance with ASTM B601, such that the pipe shows complete recrystallization to enable the pipe to meet the tests required of ASTM B43.

Brass Service Fittings

- a. Brass goods furnished under this specification shall be new and unused. And shall have an alloy composition of copper, tin, lead, and zinc in accordance with ASTM B62 "Composition Bronze or Cast Metal Castings". The material shall meet ANSI/NSF 61, Drinking Water Components – Health Effects and NSF 61 G requirements and comply with the Safe Drinking Water Act, as amended, and the U.S. Environmental Protection Agency (E.P.A.).
- b. Unless otherwise noted, all fittings shall have a minimum working water pressure of 150 psi and shall conform to AWWA Standard C800, "Underground Service Line Valves and Fittings".
- c. Detailed design of the valves and fittings shall be in accordance with Standard C800. Inspection and testing shall be in accordance with Section 6 of Standard C800 except as noted below for special shop testing. The chemical requirements shall be as noted in ASTM B60.
- d. In accordance with ASTM B62, all castings shall not have injurious blowholes, porosity, shrinkage defects, cracks, or other injurious defects. Castings shall not be plugged, welded, burned in, or impregnated. All threads shall mesh snugly, be clean cut, and be of uniform pitch. All valves shall be carefully cored and machined to insure evenly balanced walls. The keys shall be properly machined and ground and shall be covered with a non-corrosive non-toxic grease.
- e. Mechanical services shall have a 100 percent machine finish with no gaps or low spots due to insufficient parent material.
- f. All fittings shall either be stamped or embossed with the manufacturer's name.

Brass / Bronze Fittings

Composition:

All brass and bronze goods shall have an alloy composition as indicated for each of the categories as follows:

- a. Brass (Bronze) fittings in accordance with ASTM B62, entitled "Composition Bronze or Ounce Metal Castings"
- b. Brass pipe nipples in accordance with ASTM B687, entitled "Brass, Copper, and Chromium-Plated Pipe Nipples".

- c. Material composition shall be copper alloy, complying with NSF 61 and NSF 61G requirements.

Mechanical Requirements

- a. Unless otherwise noted, all fittings shall have a minimum working water pressure of 150 psi and shall conform to AWWA C800, "Underground Service Line Valves and Fittings".

Workmanship

- a. Workmanship, finish and appearance of the castings shall not have injurious blowholes, porosity, shrinkage defects, cracks, or other injurious defects. Castings shall not be plugged, welded, burned in, or impregnated. Machined surfaces shall have 100 percent machine finish with no gaps or low spots due to insufficient parent material.
- b. Threading for fittings shall be as detailed on the schedule and in accordance with Section 5.1 "Threads and Threaded Connections" of AWWA C800, unless otherwise specified. Where appropriate, threads shall conform to ASME Standard B 1.1. Pressure rating, where applicable, shall be high pressure per AWWA C800.

Testing

- a. All fittings shall be air tested at 150 psi (unless otherwise noted) while submerged in water for a minimum of five (5) seconds.

Valves

- a. All valves shall be of the ball-valve design with full port opening and have a flow passage area equivalent to the fitting outlet flow area.
- b. Balls for the valves shall be fabricated from the same material as the body.
- c. A Teflon or Nitrile seat or another material proven not to deteriorate when exposed to water treatment chemicals shall support the ball.

Testing

In addition to the testing noted in AWWA C800, the following shop testing is required.

- a. Valves shall be air tested at 150 psi (unless otherwise noted) while submerged in water for a minimum of eight (8) seconds. Valves shall be tested in the open and closed positions.

Brass / Bronze Pipe Nipples

- a. Pipe nipples shall meet the composition and mechanical properties for pipe. The pipe nipple threads shall conform to AWWA C800 and ASME B1.1.
- b. Standard length and size of nipples shall conform to ASTM B687 for standard and close nipples. 3) All other provisions of ASTM B687 "Brass, Copper and Chromium-Plated Pipe Nipples" shall apply to the materials furnished.

Certificates And Mill Test Reports

- a. Testing and certification of results shall be prepared by the manufacturer in accordance with the ASTM Specification for each of the categories being bid. In addition, mill test reports for the brass pipe in accordance with ASTM B43 shall be provided.

407 METHODS OF CONSTRUCTION

1. General: A preconstruction conference will be held at the City office prior to start of construction.
2. Alignment: All new water mains shall be placed 5 feet north or east of the centerline of the street right-of-way in all new plats and/or undeveloped rights-of-way. New water mains in and along existing roadways will be installed at a location approved by the City's Engineer. Unless otherwise specified, the location of the water mains, hydrants, valves, and principal fittings will be in accordance with the approved plans. The Developer shall provide sufficient horizontal control, in the form of centerline stakes, property corners, or other markers, as required for proper pipe location.
3. Excavation and Backfill:
 - a. Traffic to be Maintained: The Developer shall make suitable, safe, and adequate provision for necessary traffic around, over, or across the work in progress and shall schedule pavement patching to follow after backfill is completed.
 - b. Excavating in Paved Area: Prior to excavating in paved areas, the existing road surface shall be cut 1 foot (minimum) back from the outer edge of the excavation with a cutter and removed. The cuts are to be made in clean, straight lines to insure a minimum of damage to existing pavements. If the Developer fails to adequately protect the trench edges during trenching and backfilling, he will be required, at his own expense, to re-cut the edges prior to repairing the pavement.
 - c. Trench Excavation: Trench excavation shall meet the Standard Specifications and the following requirements:
 - (1) If a grade revision is made, during trench excavation, the cover over the water main must remain within the specified limits of these standards. Otherwise, the water main shall be reconstructed. All added costs of inspecting such water main reconstruction shall be charged to the Developer.
 - (2) The root systems of all trees that will not be removed during construction and are located on or near the easements and rights-of-way, shall not be cut or disturbed. Rather, they shall be tunneled or otherwise protected by the Developer to ensure that no damage is done.
 - (3) The maximum length of open trench permissible on any line, in advance of pipe laying, will be 100 feet, unless otherwise specifically approved by the City inspector.
 - (4) Upon completion of work each day, all open trenches shall be completely backfilled, leveled, and temporarily cold-patched, unless otherwise approved by the City.

- d. Trench Backfill: Trench backfill shall meet the Standard Specifications, standard details, and the following requirements:
- (1) All paved crossings shall have a temporary asphalt (cold mix) paved surfaced installed, which surface shall be a minimum of 4 inches in compacted thickness, and fully maintained level with existing undisturbed pavement until replaced with permanent repair. Sufficient cold mix to make immediate repairs and to maintain repairs until permanent repair is made, shall be on the jobsite.
- e. Boring: Boring may be ordered by the City under pavements or otherwise. The Developer may bore in lieu of open trenching for deep cuts.
4. Dewatering and Control of Water: The Developer shall dewater and dispose of the water so as not to cause injury to public or private property, or cause a nuisance or menace to the public. Dewatering systems shall be designed and operated so as to prevent the removal of natural soils.
- During excavation, installation of water mains, placing of trench backfill, and the placing and setting of concrete, excavations shall be kept free of water. The static water level shall be drawn down below the bottom of the excavation so as to maintain the undisturbed state of the natural soils, and allow the placement of backfill to the required density. The dewatering system shall be installed and operated so that the groundwater level outside the excavation is not reduced to the extent that would damage or endanger adjacent structures or property. The control, routing, storage, release, etc., of storm, ground, and/or surface water shall be the Contractor's (Developer's) responsibility and be in strict conformance with all applicable regulatory agencies, applicable permits, and permit requirements. **At no time shall the Developer release groundwater into the pipe material that has been installed within the trench.** The Developer or his Contractor shall be responsible for obtaining and adhering to all relevant permits in this regard.
- The release of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state in of the natural foundation soils, prevent disturbance of compacted backfill, and prevent flotation or movement of structures, and water mains.
- In carrying out the work within the limits of streams, or an area that will drain to a stream during a rain event, the Developer is required to comply with the regulations of the appropriate local, State, and Federal Agencies.
- The Developer shall contact the applicable agencies and secure such permits as may be necessary to cover his proposed method of operation within the areas described above. If no permit is necessary, and if directed by the City, he shall obtain a letter from the appropriate agency.
5. Compaction of Trench Backfill: Unless otherwise approved in writing by the City Engineer, compaction of trench material is required. The density of compacted backfill material shall meet requirements outlined in the Standard Specifications, or as otherwise approved in writing by the City. The City shall employ an independent soils laboratory to perform density test of areas specified by the City. The Developer shall pay all costs incurred by the City to employ the soils laboratory. In areas where it is demonstrated that the compaction standards have not been met, the area shall be excavated and re-compacted to the satisfaction of the City.
6. Trench Safety Systems: Safety systems that meet the requirements of the Washington Industrial Safety & Health Act, Chapter 49.17 RCW shall be provided for all trenches.

7. Foundation, Bedding, and Backfill Gravel: Foundation, bedding and backfill material shall be placed and compacted as required by the Standard Specifications and Standard Details.
8. Subterranean Road and Stream Crossings: The Developer may use methods that produce satisfactory results, and is acceptable to the City and the regulatory agencies having jurisdiction of the road or stream, provided that the Developer restores the road or stream to its original or superior condition. Normally, highway and stream crossings require the placing of a steel pipe casing by jacking or boring and laying the water main inside the casing. Casing materials and installation shall be as specified herein.
9. Erosion Control: The contractor/developer shall prepare and submit an erosion control plan for the City's review, comment, and approval prior to initiating construction activities. Erosion control plans shall be prepared in strict conformance with the most current Pierce County and Washington State Department of Ecology requirements. The City, by approving same, in no way warrants that the erosion control will satisfy Department of Ecology's requirements and assumes no liability in this regard. The Contractor shall be responsible for adhering to Best Management Practices in this regard.
10. Water Shutoff: Where it is necessary to shut off the existing mains to make a connection, the Developer shall notify the City 72 hours in advance of such shutoff, and the City will shut off the mains. Once the water has been shut off, the Developer shall diligently pursue the connection to completion so that the time required for the shutoff may be held to a minimum.

All connections to existing mains shall be completed the same day as they are started. The Developer shall have all necessary materials and equipment onsite for inspection by the City prior to shutting down service. If all materials and equipment are not available at the previously scheduled time for the shutdown, the shutdown will be rescheduled. All costs incurred by the City to reschedule a shutdown will be paid by the Developer.

Shutdowns that may affect commercial or emergency service may only be allowed during non-peak times (i.e., weekends or night hours at the discretion of the Public Services Department). **Unless otherwise approved in writing by the City, shutdowns will not be allowed on Mondays or Fridays.**

11. Service Connections: Prior to construction of the new water mains, and if so directed by the City, the Contractor or Developer shall remove, tag and deliver existing meters to the City of Bonney Lake Public Works yard and provide an approved and temporary jumper at existing meter locations in order to maintain service. The City staff will then inspect and overhaul the meters, and deliver them to the construction site when the Developer is ready to reinstall the meters.

Any relocated meters shall be reinstalled at the property line. A new service line shall be installed from the main to the meter setter (or service tee for double services). When a water main is relocated, a new service line shall be installed from the main to the meter setter (or service tee for double services). The Developer shall, at their sole expense, replace any sub-standard materials encountered during the relocation of meters and/or water mains. Any meters damaged or clogged during construction shall be replaced by the City and back charged to the Developer.

Service lines shall be installed up to the meter prior to conducting pressure testing. Upon installation, testing and disinfection of water mains, as witnessed and approved by the City, the services shall then be connected to meters.

12. Connections to Existing Facilities: Unless otherwise specified by the City, where it is necessary to connect to existing facilities, the operation of the existing facility shall be maintained, if possible, while making the connections. Wet-tap connections shall be installed as shown on the approved Plans and further detailed in the Standard Details. The tapping valve shall remain closed and operated only as directed by the City. Cut-in tees and crosses shall also be installed as shown on the City-approved Plans and the valves on the branches of the tee or cross shall also remain closed unless otherwise directed by the City. **Unless otherwise specifically approved by the City, in writing, a maximum of one connection to the existing system will be allowed until such time that pressure and purity tests of the “completed” system have been satisfactorily witnessed by the City.** The City will determine and approve of the initial “tie in” prior to installing same.

At connections of new piping to existing piping where no valve is installed to separate the system, all of the new piping, appurtenances and blocking shall have been installed, disinfected and tested up to the point of cutting into the existing line before the connection is made.

Prior to making a connection, the developer shall assemble all necessary material and equipment 48 hours before starting work to allow the City inspector to examine the material for acceptability. The City will notify all affected customers.

Before connection or cut-in, the fittings, pipes, valves, and couplings shall be cleaned and sterilized with chlorine solution in the same manner as provided for by the pipeline. The cleaning and sterilization shall be done immediately prior to installation and in the presence of the City. Once the water has been shut off, the Developer shall proceed rapidly and without interruption to complete the connection.

After connection to the existing system, the opening of the valves shall be done with the authorization of, and in the presence of, the City’s authorized representative.

The Developer shall not operate any valves or make any connections to the existing water main without prior approval of the City. The Developer shall make the necessary arrangements with the City for the connection to the existing water main.

13. Testing and Disinfecting: The water main pipes shall be satisfactorily disinfected, purged and tested before being placed in service. All water for testing and disinfecting must be obtained by the Developer by arrangement with the City. All pumps, gauges, plugs, saddles, corporation stops, miscellaneous hose and piping, and measuring equipment necessary for performing the test shall be furnished, installed and operated by the Developer. When testing, “feed” for the pump shall be from a barrel or other suitable container, wherein the actual amount of “makeup” water can be measured periodically during the test period.

The pipeline shall be backfilled sufficiently to prevent movement of the pipe under pressure. All concrete blocking shall be in place and time allowed for the concrete to cure before testing. Where permanent blocking is not required, the Developer shall furnish and install temporary blocking.

The pipeline shall be subjected to a hydrostatic pressure test., leakage test, and disinfected as specified in the WSDOT’s Standard Specifications, 7-09.3(23). The hydrostatic and leakage tests shall be completed, to the City’s satisfaction, only after the City has approved compaction reports provided by the Contractor.

Following the successful completion of pressure testing, water mains larger than 8 inches in diameter shall be cleaned through the use of poly pigs as indicated below or as directed by the City:

- a. A representative of the City shall be present to witness all poly pigging of water mains.
- b. The poly pig used shall be appropriately sized for the water main to be cleaned and shall be constructed of a bare durafoam (a tough, high-density polyurethane foam) that is capable of mild scraping and cleaning of residue in new water mains.
- c. The Contractor shall prepare a poly pigging plan and submit it to the City Engineer for approval prior to testing.
- d. The poly pig shall be inserted into the main via a poly pig launch at the locations shown in the approved plan.
- e. When the poly pig is removed, all debris collected in front of the poly pig shall be removed and disposed of in accordance with all local, state, and federal regulations.
- f. If required by the City, the Contractor shall use a “cleaning poly pig” that has a tough coat of polyurethane synthetic rubber applied in a criss-cross pattern. The “cleaning poly pig” shall be launched and debris shall be removed as previously described for poly pigging.
- g. Water used to propel the poly pigs shall be obtained from the City via a nearby fire hydrant with the use of approved backflow prevention and/or required metering devices.
- h. When the City determines that the main is clean of debris and organic matter, the water main shall be disinfected in accordance with these specifications.
- i. Fees for water usage that is supplied by the City’s water system shall be as determined by the City.

The water system will not be acceptable to the City until a satisfactory test report for bacteriological analysis is received from the DOH or other certified independent laboratory.

Chlorinated water used for disinfection shall be discharged in strict compliance with regulatory guidelines and requirements. The contractor shall be responsible for procuring all permits, making adequate provisions, and incurring all costs in this regard, to include, but not be limited to, City approval of point and method(s) of discharge, hoses, trenching, hauling, etc.

14. Adjustment of New and Existing Utility Structures to Grade: This work consists of constructing and/or adjusting all new and existing utility structures encountered on the project to finished grade.

On asphalt concrete paving projects, the valve boxes shall not be adjusted until the pavement is completed, at which time the center of each valve box lid shall be relocated from references previously established by the Developer. The valve box lid shall be cleaned and free of debris prior to re-installation.

The asphalt concrete pavement shall be cut and removed to a neat circle, as further noted herein, and shown in the Standard Details. The valve box and lid shall be brought up to desired grade, which shall conform to the surrounding road surface. A concrete collar shall be placed per the

Standard Details. Care shall be exercised to insure the valve box is oriented as shown in the Standard Details.

Asphalt concrete patching shall be completed in strict conformance with requirements specified in Section 600.

15. Final Inspection: The Developer shall bear all costs incurred in correcting any deficiencies found during inspection, including the cost of any additional inspection that may be required by the City to verify the correction of said deficiency. Authority of inspectors shall be as specified in Section 300.
16. Salvage: When directed by the City (or as shown on the approved construction plans), the Contractor shall salvage all abandoned fire hydrants, valve boxes, valve marker posts, hydrant guard posts, and other related appurtenances and/or pipe, and deliver the material to the City's Public Works yard. The Contractor shall prearrange delivery with the City's operation and maintenance supervisor. The Contractor shall not use salvaged materials in new construction unless otherwise approved in writing by the City. The Contractor shall remove hydrants by first cutting the supply pipe to avoid damage to the hydrant. The abandonment pipe shall be provided with a concrete plug and the excavation trench shall be satisfactorily backfilled and compacted. Excess waste shall be removed and waste hauled by the Contractor. Unless otherwise approved by the City, salvageable materials that for any reason are damaged or lost by the contractor shall be replaced with new materials and subsequently delivered to the City.
17. Standard Water Notes: The following notes shall be included on all plans for water main extensions:
 - a. Prior to any construction activity, the Developer shall arrange and attend a preconstruction conference with the City of Bonney Lake.
 - b. An approved copy of these Plans must be on the jobsite whenever construction is in progress.
 - c. All work and material shall be in accordance with the City of Bonney Lake approved standards.
 - d. All water system improvements shall be constructed in accordance with these approved Plans. Any deviation from the Plans will require approval from the owner, engineer, City and appropriate public agencies.
 - e. Notify the City of Bonney Lake five (5) working days prior to beginning construction and for any restarts of work.
 - f. The City of Bonney Lake shall be notified 3 working days prior to the time the Developer would like to connect to existing mains or for installation of tapping tees. The connection shall be done in accordance with the City requirements. Developer shall not operate any valves within the existing system; these will be operated by the City of Bonney Lake personnel only.
 - g. For aid in utility location, call 811 or 1-800-424-5555, 48 hours (2 working days) prior to beginning of construction. Existing utilities, whether shown or not, shall be located prior to construction, so as to avoid damage or disturbance, and the Developer shall assume all responsibility and costs connected therewith to protect, maintain and repair, where necessary.

- h. Pipe shall be ductile iron, AWWA Class 53 for 4-inch pipe and Class 50 for 6-inch pipe or larger. Joints shall be rubber gasketed, push-on type, or mechanical joint, meeting AWWA specifications. Fittings shall be AWWA, cement lined, ductile iron, either mechanical joint or flanged, as indicated herein.
- i. Unless otherwise specified valves 12 inches and smaller shall be resilient seated gate valves: Acceptable valves are Mueller, Clow, M&H or Waterous. Valves larger than 12 inches shall be butterfly valves. Acceptable valves are M&H 450 or 4500 or Pratt equivalent.
- j. Hydrants shall be Mueller Centurion A-423, Clow Medallion, Waterous (Pacer), American AVK (Series 2780) or M&H (929). Hydrants shall conform to AWWA Standard C502-73.
- k. The water main construction phase will not be considered complete until the installation is acceptable to the City of Bonney Lake including a satisfactory hydrostatic pressure test, a satisfactory disinfection test, satisfactory flow of service lines, and completion of all items on the inspector's punch list.
- l. When directed by the City (or as shown on these approved construction plans), the Contractor shall salvage all abandoned fire hydrants, valve boxes, valve marker posts, hydrant guard posts, and other related appurtenances and/or pipe, and deliver the material to the City. Unless otherwise approved by the City, salvageable materials that for any reason are damaged or lost by the contractor shall be replaced with new materials and subsequently delivered to the City.