

Chapter 7 : Distribution Facilities Design & Construction Standards

This section of the WSP contains design and construction standards applicable only to extensions of transmission mains and distribution lines. WDOH approval of this plan section means that Sumas does not need to obtain written WDOH approval of individual project reports and construction documents for transmission and/or distribution projects. Such projects will be reviewed by Sumas and/or its engineering consultant. Sumas shall continue to submit project reports to WDOH for reservoirs, booster pumps, pipe linings, and tank coatings, and source-of-supply projects.

7.1 Project Review Procedures

Submittal

Design drawings for a proposed distribution system extension shall be prepared in accordance with the following drawing standards:

1. All plans shall be on a reproducible cut sheet, 24" X 36", and shall include a title block and general notes.
2. Three sets of plans shall be submitted to the City.
3. The scale for plan and profile drawings shall be no less detailed than 1" = 50' for horizontal and 1" = 5' for vertical. When more than one sheet is required to cover all of the construction area, an overall index drawing is required.
4. The plans shall be produced by an experienced draftsman and shall be of professional workmanship. The plans shall be sealed by a professional engineer licensed in the State of Washington.
5. Plans shall contain the following information:
 - Current plat information.
 - Maximum 5 foot contour based upon NGVD 29 vertical datum.
 - Relationship of the extension to existing and proposed utilities, including water, sewer, storm sewer, electrical, phone, natural gas, and cable TV.
 - Relationship of the extension to street paving, curb, gutters, sidewalks, rights-of-way, and easements.
 - Scale, north arrow, legend, datum, vicinity map, and general notes. The applicant shall also provide the description, location, and elevation of all bench mark data available on the project site and this information, wherever possible, shall be shown on the plans.
 - All detail drawings, including standard details.

Review

The plans shall be reviewed by the City and/or its engineering consultant for conformance to the design and construction standards established in this chapter. If inconsistent with standards, the plans shall be red-lined and returned to the developer for correction and resubmittal. Once consistent with standards, the plans shall be marked as approved by the Utilities Superintendent and one set shall be returned to the developer. The developer shall not begin construction prior to receiving City approval of plans.

7.2 Policies and Requirements for Outside Parties

1. All water system construction and reconstruction shall be done pursuant to a design that, when fully implemented, will provide the flow volumes and pressures established below. Off-site improvements necessary to meet this requirement shall be the responsibility of the developer. Hydraulic modeling necessary to confirm consistency with standards shall be performed by the City at the developer's expense.
2. Water distribution facilities shall be designed to provide fire flow of 1,500 gpm in the Industrial zone, 750 gpm in all commercial zones, and 500 gpm in all residential zones.
3. Water storage facilities shall be sized to provide fireflow of 1,000 gpm for 120 minutes.
4. A minimum of 7.5 feet of recorded easement or dedicated right-of-way must be provided on each side of a water line. If an easement or right-of-way contains multiple utilities, the easement or right-of-way must be no less than 30 feet in width.
5. Water lines must generally be looped. A dead-end line is permissible only within a cul-de-sac that abuts already-developed property through which no utility connection can be made. Within a new cul-de-sac abutting undeveloped property, a utility easement is required at the end of the cul-de-sac to provide future looping.
6. Water lines must generally be extended across the full width of a property to allow for future extension. A line need not be extended to the far property boundary when the neighboring parcel is already developed in such a manner that no utility connection can be made.
7. Within new subdivisions, short plats, and binding site plans, water lines should generally be located parallel to the center line on the east or north sides of the street.
8. Where the City determines that the possibility of contamination of the potable water supply exists, the developer shall install appropriate cross-connection control devices in accordance with WAC 246-290-490. The City shall approve the size, kind, and location of device. The City may require that service lines providing fire flow be equipped with a fire detection check valve.
9. Generally a meter must be installed for each structure receiving water service and for each residential dwelling unit. If approved by the City, a single meter may be used to measure the consumption of multiple dwelling units within one building where the building is under single ownership, and to measure the consumption of multiple buildings under single ownership where separate water lines are impractical.

7.3 Design Standards

The following standards shall apply for water system improvements within the City of Sumas. Existing standards referenced below are the most current versions of: "Standard Specification for Road, Bridge, and Municipal Construction," published jointly by the Washington State Department of Transportation and the American Public Works Association (WSDOT/APWA); Standards of the American Water Works Association (AWWA).

1. Design criteria shall be in accordance with the current WDOH "Water System Design Manual" or with the standards established herein, whichever is more stringent.
2. The minimum pressure allowed by the City, at all points within the service area, is 30 psi under conditions of Peak Hourly Demand (PHD), except for fire flow conditions.
3. The minimum pressure allowed by the City, at all points within the service area, is 20 psi under the condition of PHD in combination with fire flow.
4. Within the commercial and residential zones, minimum diameter for water lines is generally 8 inches. 6-inch and/or 4-inch diameter pipe may be allowed at the discretion of the City when: (a) future extension is not anticipated; and (b) hydraulic modeling confirms that required fire flow is available to hydrants on the line. In no case shall new fire hydrants be supplied by water lines less than 6 inches in diameter. The City may waive the requirement of hydraulic modeling in instances where the extension consists of a looped 6-inch line less than 1,000 feet in length connected at each end to lines 8 inches or larger in diameter. Within the Industrial zone, minimum diameter for water lines is generally 10 inches. 8-inch diameter pipe may be allowed at the discretion of the City when hydraulic modeling confirms that required fire flow is available to hydrants on the line.
5. A hydrant or blow-off assembly shall be installed at the end of any dead-end line greater than 200 feet in length. The location and construction of the blow-off shall be such that there is no possibility of back-siphoning into the distribution system.
6. Fire hydrants shall be Clow Medallion fitted with a 5-inch Stortz connection on the steamer port, secured to the hydrant with aircraft cable. Fire hydrants shall be installed at intervals of 600 feet within commercial and residential zone districts and intervals of 500 feet within the Industrial zone.
7. Air-vacuum release valves shall be provided at points of high elevation within the system.
8. Minimum cover on water mains shall be 3 feet unless otherwise approved by the City. Minimum separation of potable water mains and sanitary sewer lines shall be in accordance with Section 2.41 of the current edition of the "Criteria for Sewage Works Design" published by the Washington State Department of Ecology.
9. All pipe material for new extensions shall be constructed with "lead free" materials in accordance with WAC 246-290-220. Ductile iron pipe shall be AWWA C-151 thickness class 52 with cement-mortar lining, polyethylene encased, and shall meet WSDOT/APWA specification 9-30.1(1). PVC pipe shall be AWWA C-900 and shall meet WSDOT/APWA specification 9-30.1(5)(A). All fittings shall be ductile iron, shall conform to WSDOT/APWA specification 9-30.2, and shall have a minimum pressure rating of 350 psi.

10. Valves shall be resilient seated gate valves, Waterous Series 500 or equal, with a minimum pressure rating of 200 psi, and shall conform to the latest revision of AWWA specification C509. Valves shall be installed along the water main at intervals not to exceed 500 feet within the Industrial zone and not to exceed 800 feet within commercial and residential zones. Valves shall be placed on each main at all junction points.

7.4 Construction Standards

Water Mains Installation Standards

1. The developer shall inform and obtain approval from the City for any proposed changes in the water plans prior to construction of that change.
2. The developer is responsible for contacting all utility owners for locations and for field verification of all utility locations prior to construction. The one-call number for underground utility locates is 1-800-424-5555. The developer shall be responsible for maintaining the integrity of all existing utilities and for notifying the City promptly of any conflicts with existing utilities.
3. All water line trenching, bedding, installation, and testing shall conform to WSDOT/APWA specifications 7-8 through 7-15, AWWA specifications C600 and C651, and City standard construction detail drawings shown below.
4. Bedding material for ductile iron pipe shall comply with WSDOT/APWA specification 9-03.15. Bedding material for PVC pipe shall comply with WSDOT/APWA specification 9-03.16.
5. Backfill under pavement shall consist of material conforming to WSDOT/APWA 9-03.19. Backfilling shall be in accordance with WSDOT/APWA standard plan drawing B-11 and WSDOT/APWA specification 7-08.3(3), i.e., 95% of maximum density under pavement, 85% of maximum in other areas.
6. Installation of valves shall conform to WSDOT/APWA specification 7-12. A cast iron valve box and concrete marking post shall be installed with each valve.
7. The developer shall mark all underground water lines and services with 14-gauge "locate wire" placed 1 foot above the pipe.
8. All work must be inspected and approved by a representative of the City, and 24 hours notice must be given prior to starting work and to schedule inspections.
9. All water lines, fittings, and appurtenances shall be pressure tested at 200 psi in accordance with WSDOT/APWA specification 7-11.3(11). The developer shall disinfect, flush, and provide representative bacterial tests in accordance with WSDOT/APWA specification 7-11.3(12). The City shall witness the sampling and pressure testing. The developer shall provide the City with 48 hours notice prior to conducting any tests or sampling.
10. A satisfactory bacterial report shall be received by the City before lines are placed in service.
11. Underground fire sprinkler systems shall be installed by a person with a Level "U" certificate or by a person that regularly works for a company that holds such a certificate.

Water Service Installation Standards

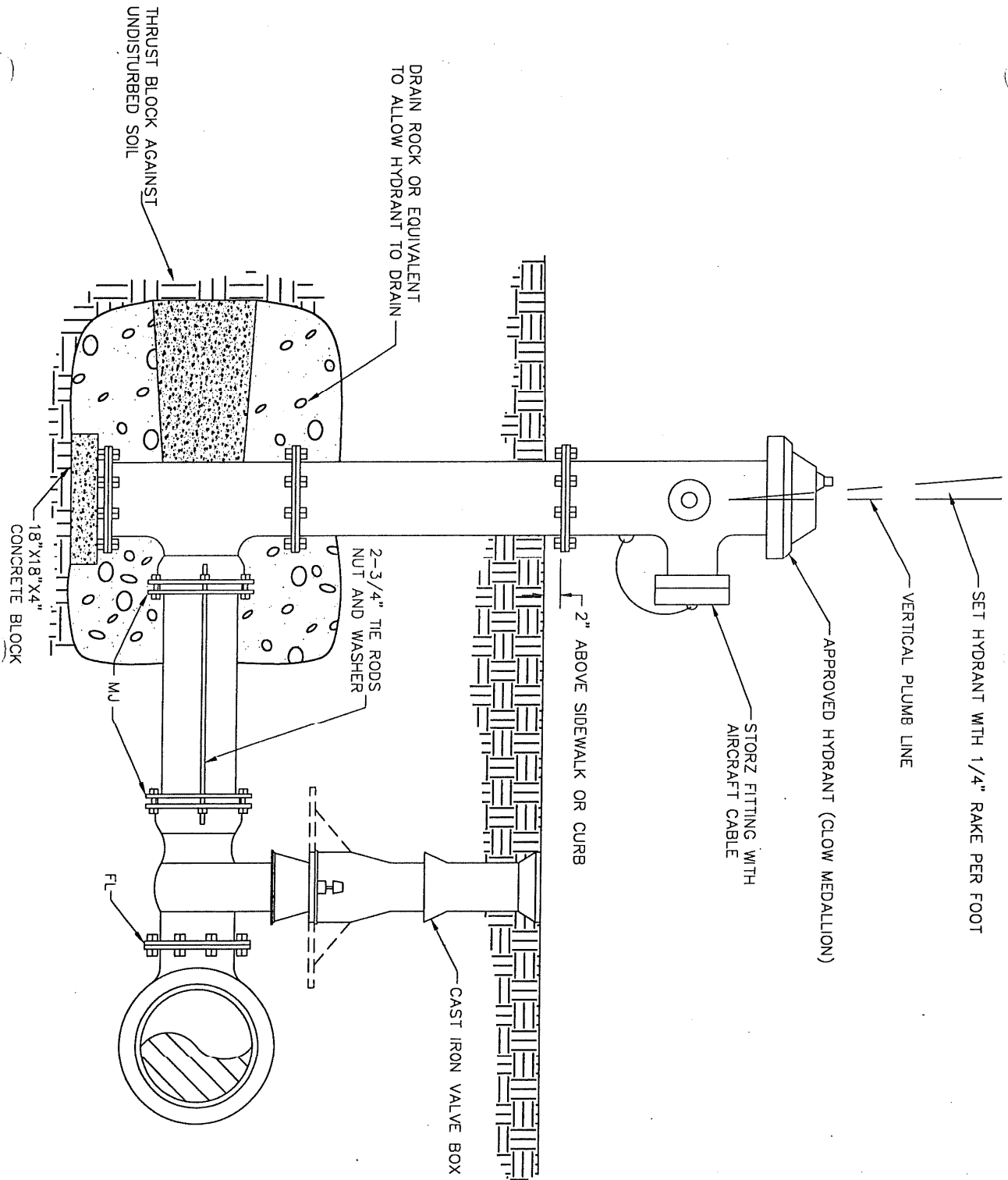
1. All service connection trenching, bedding, installation, and testing shall conform to City specifications and to the standard City detail drawing shown below.
2. The City is responsible for installing the water service from the water main to the meter box, and for installation of the meter box, meter, and associated valves and fittings. The property owner is responsible for installation of the water service from the meter to the house.
3. The property owner or developer shall be responsible for staking of lots and/or property lines to assure correct water service locations. Rework due to the owner's failure to provide accurate survey shall be performed by the City at the owner's expense.
4. The water service pipe shall have a minimum depth of 24 inches and a maximum of 36 inches, including under ditch sections.
5. Side sewer lines and water service lines shall maintain a minimum horizontal separation of 4 feet and a vertical separation of 18 inches with water installed above sewer. Service lines shall be installed in separate trenches. Refer to DOE's "Criteria for Sewage Works Design" in the event these standards can not be physically met.
6. All fittings shall be brass.
7. All service connections to the water mains shall be made using saddles of the size and type suitable for use with the pipe being installed. For services less than 1.5 inches, saddles shall be Romac 101 with IP tap. For services 1.5 inches or greater, saddles shall be Romac 202.
8. Corporation taps shall make as nearly as possible a 45 degree angle off the vertical center line of the main. No tap is to be made on the top of a water main or off the reverse side of the pipe.
9. Corporation stops shall be Ford FB1101, sized to match polyethylene pipe, with inlet IP standard thread and outlet compatible with polyethylene piping, compression fittings only, with no special adapters.
10. Within the public right-of-way, service piping shall be polyethylene, PE 3406, ASTM D-2239, SDR 7, 200 psi, IP size and shall conform to the requirements of AWWA C901. Minimum service size shall be ¾ inch to property line for single family residences or for dual service installation. All service installations shall be dual service unless approved by the City.
11. The meter box shall be Brooks with black reader lid. The top of the box shall be flush with the finished grade. The meter box shall be located within one foot of the property line and as close to the property corner as possible.
12. The meter shall be a Neptune T-10 ARB-V 5/8" X ¾" with cubic feet readout, remote sensing registers, and plastic frost bottom. Prior to connecting the meter, the service connection shall be flushed.
13. The curb stop shall be a Ford U Branch UV 6342-W.
14. The double check valve shall be Ford HHC-11-333.

15. The valve on the downstream side of the meter shall be Ford GA 13-332 angle compression meter valve.
16. The property owner shall be responsible for supply and installation of pressure reducing valves on services. Pressure reducing valves shall be installed downstream of the meter and check valve.
17. No service is to be covered prior to inspection by the City. During the inspection, the service shall be turned onto its full capacity to check flow and guarantee that the line has been flushed.
18. New services shall be pressure tested. No use of water through a newly installed service shall be allowed until the service has been inspected, pressure tested, chlorinated, and a satisfactory bacteria test received.
19. The water service shall be marked with 14-gauge "locate wire" placed 1 foot above the pipe.

7.5 Construction Certification and Follow-up Procedures

1. Before final acceptance of work by the City, the developer shall provide the City with an as-built drawing mylar and print certified by a professional engineer or a licensed surveyor. The developer is responsible for obtaining as-built information as construction progresses. The as-built drawing shall include:
 - The exact location of all water mains and the approximate location of all other underground and above-ground utilities
 - The location of all vertical and horizontal bends in the water system. Stationing shall be along the length of the extension.
 - The location of all water valves, hydrants, hydrant valves, and blow-offs with distance along centerline and distance from centerline.
 - The location of all water service taps into the water main.
 - The location of all water service boxes and meters with distances to the main tap and to the corresponding property corners.
 - The location of all utilities within easements. This includes distances to the utilities from the easement boundary line.

Figure 15. Standard Construction Details



CITY OF SUMAS
 PUBLIC WORKS DEPARTMENT
 HYDRANT INSTALLATION DETAIL

433 CHERRY STREET SUMAS, WA 98295 (360) 988-5711, FAX (360) 988-8855

PUBLIC WORKS DIRECTOR

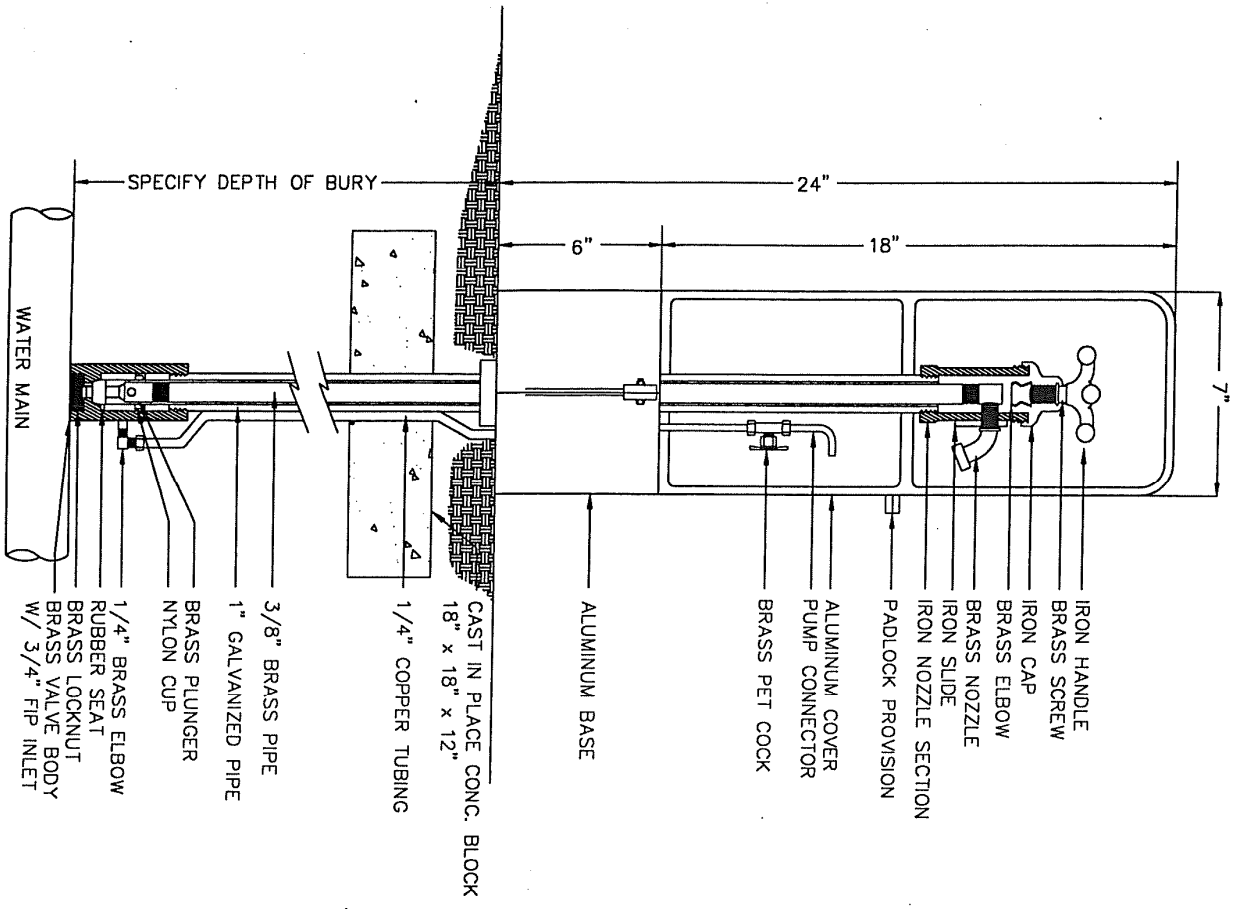
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- IRON HANDLE
- BRASS SCREW
- IRON CAP
- BRASS ELBOW
- BRASS NOZZLE
- IRON SLIDE
- IRON NOZZLE SECTION
- PADLOCK PROVISION
- ALUMINUM COVER
- PUMP CONNECTOR
- BRASS PET COCK
- ALUMINUM BASE
- CAST IN PLACE CONC. BLOCK
18" x 18" x 12"
- 1/4" COPPER TUBING
- 3/8" BRASS PIPE
- 1" GALVANIZED PIPE
- BRASS PLUNGER
- NYLON CUP
- 1/4" BRASS ELBOW
- RUBBER SEAT
- BRASS LOCKNUT
- BRASS VALVE BODY
W/ 3/4" FIP INLET

NOTES

1. SAMPLING STATION SHALL BE INSTALLED ONLY WHERE A FIXED FAUCET INSIDE A BUILDING IS NOT AVAILABLE.
2. STATION SHALL BE AN ECLIPSE No. 83, FREEZE PROOF SAMPLING STATION AS MANUFACTURED BY KUPFERLE FOUNDRY COMPANY (1-800-231-3990) OR ENGINEERING APPROVED EQUAL.
3. AFTER THE WATER SAMPLES HAVE BEEN TAKEN, THE RISER PIPE SHALL BE DRAINED USING A HAND PUMP IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

CITY OF SUMAS
PUBLIC WORKS DEPARTMENT
SAMPLING STATION DETAIL

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Figure 19. Standard Construction Details

