

Chapter 6

DRINKING WATER

Chapter 6

- 6.010 General
- 6.030 Main Line
- 6.035 Pressure Reducing Valve
- 6.040 Connection to Existing Water Main
- 6.050 Service Interruption
- 6.060 Hydrants
- 6.070 Valves
- 6.075 Meters
- 6.080 Casing
- 6.090 Air and Vacuum Release Valve
- 6.100 Blowoff Assembly
- 6.105 Sampling Station
- 6.106 Fire Service Line
- 6.110 Backflow Prevention
- 6.111 Backflow Prevention Assemblies
- 6.112 Backflow Assembly Installation Requirements
- 6.120 Service Connection
- 6.130 Required Separation Between Water Lines and Sanitary Sewers
- 6.140 Irrigation
- 6.150 Surveying and Staking
- 6.160 Trench Excavation
- 6.165 Thrust Blocking
- 6.170 Backfilling
- 6.175 Street Patching and Restoration
- 6.180 Hydrostatic Tests
- 6.190 Sterilization and Flushing
- 6.200 Abandonments
- 6.210 Asbestos Cement Pipe Abandonment
- 6.300 Groundwater Monitoring Wells
- 6.400 Telecommunications Equipment at Drinking Water Utility Sites
- Appendix 1: List of Standard Drawings
- Appendix 2: Standards for Telecommunications Equipment at Drinking Water Sites

6.010 General

Any extension of the Olympia water system must be approved by the Public Works Department, and all extensions must conform to the Department of Health, the most current version of the City of Olympia Water System Plan, and Olympia 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 volumes at acceptable pressure and velocity will be attained in case of fire. An analysis of the system may be required if it appears that the system might be inadequate.

Anyone who wishes to extend or connect to the City's water system should contact the Community Planning and Development Department for a water extension/connection fee estimate. This fee estimate is an estimate of the costs due the City for a waterline extension or connection.

Water meters will be released at the same time the building permit is issued. In new plats, prior to the release of any water meters, all Public Works improvements must be completed and approved, including granting of right-of-way

or easements, Record Drawings conforming to section 3.065 of these Standards submitted and approved, or bonded for in accordance with Chapter 2 of these Standards, and all applicable fees must be paid.

And issuance of building permits for new construction of single-family subdivisions will not occur until the Director of Community Planning and Development or their designee has given final approval of the water system.

Issuance of building permits for commercial projects will not occur until the required fire protection facilities, minimum required fire flows and emergency access, meeting the International Fire Code Requirements are completed and accepted. A construction completion surety, in accordance with Chapter 2 of these Standards, may be required for the remaining public works improvements.

Certificate of Occupancy for new commercial developments will not be issued until the Director of Community Planning and Development or their designee has given final approval for all public infrastructure improvements by being either constructed and complete or an acceptable completion surety is in place for the improvements.

6.030 Main Line

A. Water mains will be sized to provide adequate domestic plus fire flow at the required residual pressure. Fire flow requirements will be determined by the Olympia Fire Department; however, the quantity of water required will in no case be less than 1000 gpm at 20 psi residual pressure.

The minimum water main size will be 6 inches diameter where looped. Dead-end mains will be 8 inches diameter to the last fire hydrant. Larger-sized mains are required in specific areas outlined in the current City of Olympia Water System Plan. Nothing will preclude the City from requiring the installation of a larger-sized main in areas not addressed in the most current version of the City of Olympia Water System Plan if the City determines a larger size is needed to meet fire protection and domestic requirements or for future service.

If approved by the City of Olympia, existing 2-inch main lines may have a maximum of 10 residential units on a dead-end line and a maximum of 20 residential units on a looped line.

All water mains that may be extended or looped will end with an approved gate valve and MJ plug.

B. All water main pipe will have flexible gasketed joints and will comply with one of the following types:

2-inch Water mains will be HDPE meeting the requirements of AWWA Class 200, C901, and C906, or Class 200 PVC.

All water main 4-inch to 10-inch diameter will be ductile iron pipe and will conform to AWWA C151, Class 50, or HDPE pipe meeting the requirements of AWWA Class 200, C901, and C906.

All water main 12-inch diameter and larger will be ductile iron pipe and will conform to AWWA C151, Class 50.

All fire service connections 4-inch diameter and larger will be ductile iron or HDPE pipe and will conform to AWWA C151, Class 52. See Section 6.106 for more information.

All sizes of ductile iron pipe will be cement mortar-lined, conforming to AWWA C104.

All pipes will be joined using nonrestrained joints that will be rubber gaskets, push-on type or mechanical joint, conforming to AWWA C111.

C. All fittings for ductile iron pipe or HDPE pipe will be ductile iron compact fittings conforming to AWWA C153 or AWWA C110 and C111. All fittings will be cement mortar lined conforming to AWWA C104. Plain-end fittings with mechanical joint retainer glands installed on the plain ends will be ductile iron. All fittings will be connected by flanges or mechanical joints. Where required, mega-lug retainer glands will be used.

D. All pipe and services will be installed with continuous tracer tape installed 12 inches to 18 inches under the final ground surface, Terra Tape D or approved equal. The tape will be plastic non-biodegradable metal core or backing that can be detected by a standard metal detector, colored blue for water, and labeled "Water".

In addition, toning (tracer) wire will be installed over all pipe, conduit and service lines, colored blue for water. Toning wire will be UL listed for direct bury, Type UF, HDPE or HMWPE-coated, 12-gauge coated copper taped to the top of the pipe to prevent movement during backfilling. Nylon PVC coated THHN wire shall not be used for toning wire. The wire will be laid loosely enough to prevent stretching and damage. The wire will be brought up and tied off at valve body, meter setter, or other fitting or structure as necessary. Sufficient wire to allow a minimum of 2 feet (slack) above final grade shall be coiled/looped into the valve box or structure to ensure the end of the wire will be accessible to hook up to a locator.

A 1-pound magnesium anode will be buried with the wire and every 1,000 linear feet thereafter for cathodic protection of the toning wire. All toning wire splices and connections will join wires both mechanically and electrically and will employ epoxy resin or heat-shrink tape insulation.

Toning wire shall be tested by an approved locating company prior to acceptance of the pipe system. A written notice from the contractor to the City at least two working days prior to the test is required; such notice is to include information on the relevant experience of the company proposed to complete the testing.

E. The minimum cover for all water mains, from top of pipe to finish grade, will be 30 inches for ductile iron, 36 inches for HDPE. The maximum cover for all water mains, from top of pipe to finish grade, will be 60 inches for all materials, unless otherwise approved by the City of Olympia.

F. Water mains ~~will shall~~ be extended and “looped” to the nearest existing water main as part of any commercial or multifamily development, - where feasible to ensure improved water quality and provide redundancy of service, except where impractical or infeasible due to topography or where an easement(s) are not obtainable. For larger commercial and residential developments are proposed, a minimum of two connection points to the existing water system shall be provided.

~~The w~~Water mains ~~will shall~~ be designed not to exceed velocities of 7 feet per second during any flow condition to reduce the chance of water hammer. Pressure of 45 to 60 psi will be maintained at the main during peak-day demands. A pressure of 45 psi provides adequate pressure at all the fixtures, ~~and while~~ pressure above 65 psi results in excess water usage and is above the target level set in the City of Olympia Water Conservation Program.

G. Within easements outside of City ROW, at each bend in the water main a bend marker shall be placed indicating the angle of the bend and direction of the water main each way. Bend marker posts shall be 4-inch Carsonite CWV-116 posts stamped with “Caution Water Main.”

6.035 Pressure Reducing Valve

A pressure-reducing valve (PRV) is required on the customer’s side of the meter for all water services that have a static water pressure above 80 pounds per square inch (psi). All PRVs are owned by the property owner after the initial installation is complete.

For all new construction or remodels for which a building permit is required, with the exception of public works projects replacing existing water mains and existing service connections, the developer or permittee is required to pay for and install an approved PRV when a PRV is required. The developer or permittee shall then warrant the PRV for one year from the date of installation, after which the property owner is required to maintain the PRV at its own expense.

For PRVs installed as part of a public works project replacing existing water mains and/or existing service connections, the PRV will be maintained by the City for one full year after the date of the initial installation, after which the property owner is required to maintain the PRV at its own expense.

6.040 Connection to Existing Water Main

The developer’s engineer will be responsible for determining the scope of work for connection to existing water mains. A minimum of ten working days’ notice following application at the Community Planning and Development Department is needed to schedule shutdowns. The City of Olympia Drinking Water Operations will be consulted regarding fittings or couplings required.

It will 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. All excavation, connections, piping, tapping, valve fittings, services, anchors, blocking, bedding, backfill, compaction, restoration, or other labor and materials required will be furnished and placed by the contractor.

A list of City of Olympia-approved tapping contractors can be obtained at the Community Planning and Development Department. The City of Olympia Drinking Water Operations will be notified 48 hours (two working days) prior to the contractor performing the tap.

The City of Olympia Drinking Water Operations will make all shutdowns on existing mains. The contractor may operate the valve under the immediate supervision of a Drinking Water Operations Supervisor.

6.050 Service Interruption

Following application at Community Planning and Development Department for connection to the existing water main, the contractor will give the City a minimum of ten working days' 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 of the water service interruption 48 hours in advance. The contractor will make every effort to schedule water main construction with a minimum interruption of water service. In all situations, the City will dictate scheduling of water main shutdowns so as not to impose unnecessary shutdowns during specific periods to existing customers.

6.060 Hydrants

A. The lead from the main to the fire hydrant will be ductile iron cement mortar-lined Class 50, and no less than 6 inches in diameter and a maximum of 50 feet in length. Greater than 50-foot lengths will require oversizing, as designed by an engineer.

B. Fire hydrants will have two 2 1/2-inch outlets and one 4-inch pumper port outlet with PCT threads and 5-inch Storz adaptor, Style 5-37 w/sc cap. All 2 1/2-inch outport threads will be National Standard thread. The valve opening will be 5 1/4-inch diameter. The hydrant will have a positive and automatic barrel drain and will be of the safety or breakaway style.

Hydrants will be M&H Style 129, Clow Medallion, East Jordan, Mueller Centurion, or AVK. All hydrants will be bagged until the system is approved. Developments being served by existing hydrants will be required to upgrade the hydrants to these standards.

Hydrants will be painted with Parker Paint Marathon Enamel Safety Yellow paint or equal, except the AVK hydrant, which comes pre-coated. All chains between caps and hydrant shall be removed.

C. Unless otherwise required by the Olympia City Engineer, the following guidelines will apply for hydrant number and location:

1. At least one hydrant will be installed at all intersections.
2. Hydrant spacing of 300 feet will be required in all areas except single-family and duplex residential areas.
3. Hydrant spacing of 600 feet will be required for single-family and duplex residential areas.
4. When any portion of a proposed building is in excess of 150 feet from a water supply on public street, on-site hydrants will be required. Such hydrants will be located pursuant to the Olympia Fire Department, and easements for such hydrants will be granted to the City.

D. Fire hydrants will be set as shown in the City of Olympia Standard Drawings.

E. Requirement regarding use, size, and location of a fire department connection (FDC) and/or post indicator valve will be determined by the Building Official and the Olympia Fire Department. Location of the FDC will be shown on the water plans.

- F. Where needed, the Public Works Department or Olympia 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.
- G. Fire hydrants must be installed, tested, and accepted prior to the issuance of a building permit.
- H. Fire hydrants shall be abandoned per 6.200.
- I. Fire Hydrants will not be installed over areas being used for underground stormwater treatment storage.

6.070 Valves

All valves and fittings will be ductile iron with ANSI flanges or mechanical joint ends. All existing valves will be operated by City employees only.

Valves will be installed in the distribution system at sufficient intervals to facilitate system repair and maintenance, but in no case will there be less than one valve every 600 feet. There shall be 3 valves on all TEES and 4 valves on all crosses in each intersection. Specific requirements for valve spacing will be made at the plan review stage.

A. System gate valves will be resilient wedge, NRS (Non-Rising Stem), with O-ring seals. Valve ends will be mechanical joint or ANSI flanges. Valves will conform to AWWA 509-80 or AWWA C-515. System gate valves will be M&H, Kennedy, AVK, Mueller, or Clow.

Gate valves will be used on all 2- to 10-inch lines. Gate valves may be used on 12-inch lines.

B. Butterfly valves. Butterfly valves will conform to AWWA C504-87, Class 150B, with cast iron short body and O-ring stem seals. Butterfly valves will be Mueller, M&H, Clow, Kennedy, or American Flow.

Butterfly valves may be used for 12-inch lines and will be used on all lines 14 inches and larger.

C. Valve box. All valves will have a standard Rich 950 ductile iron water valve box set to grade. If valves are not set in a paved area, a 1-foot by 6-inch-thick circular concrete pad shall be placed around the valve box. In areas where the valve box falls in the road shoulder, the ditch and shoulder will be graded before placing asphalt or concrete pad. Valve box lids will be ductile iron, shall be anti-kickout, and marked "City of Olympia Water." See City of Olympia Standard Drawings.

Valve marker post. Valve marker posts will be 4-inch carsonite CWV-116 posts stamped with "Caution Water Valve." See City of Olympia Standard Drawings.

6.075 Meters

All meters 6-inch and larger will be Badger with an Itron remote automated encoder-based meter reading system. Meters must be totally field programmable, including meter number. See City of Olympia Standard Drawings.

6.080 Casing

Steel casing pipe will be Schedule 20 steel or equal. Pipe spacers will be Cascade Style CC5 with 8-inch runners as available from Cascade Waterworks or approved equal. Casing pipe and spacers will be sized for pipe being installed. Install minimum of three spacers per section of pipe. The casing pipe will then be sand-packed.

6.090 Air and Vacuum Release Valve

Air and vacuum release valves (ARV) will be APCO 147C or Clay valve combination air release valve. Installation will be as shown on City of Olympia Standard Drawings.

The installation will be set at the high point of the line when required. Where possible, pipes are to be graded to prevent the need for an air release valve. Air release valves may not be required when services are in the vicinity.

6.100 Blowoff Assembly

If a fire hydrant is not located at the end of a dead-end main, a blowoff assembly will be required. On water mains that will be extended in the future, the valve that operates the blowoff assembly will be the same size as the main

and provided with a concrete thrust block. The pressure rating for blowoff assemblies will be 200 psi. Installation will be as shown on City of Olympia Standard Drawings.

6.105 Sampling Station

The number of sampling stations required for subdivisions and other major developments will be determined on a case-by-case basis by the Water Quality Program. An Eclipse #88-SS stainless steel water quality sampling station manufactured by Kupferle is the City's standard. See Standard Drawing 6-18 for installation details.

6.106 Fire Service Line

The City shall maintain that part of the fire service line (also referred to as the fire department connection, or FDC) from the connection at the main to and including the valve closest to the main (in most cases the "tapping" valve), which shall be a 4-inch minimum gate valve. The property owner shall own and maintain the fire service line from this valve to and within the building. If the water main is located in public right-of-way (ROW), then the closest valve to the main shall also be in the ROW. If the main is in an easement on private property, then the valve shall be within 2 feet of the main. Toning wire shall be installed on all fire service lines, from the main to the building, per section 6.030.D.

Only ductile iron or high density polyethylene (HDPE) pipe, 4-inch minimum nominal diameter, may be used for fire service lines located partly or entirely within a street ROW or water utility easement, except that if hydraulically warranted a 3-inch HDPE may be approved. The tapping valve for a 3-inch HDPE pipe shall remain 4-inch.

Fire service line plans shall be submitted to the City for approval prior to construction. Fire service lines that do not require thrust blocks, bends, or changes in alignment between the water main and the building will not require plans to be submitted by a licensed professional engineer. All other fire service line plans shall be designed, sealed and submitted by a professional engineer, and meet the requirements of Sections 3.030, 3.040, 3.045 and 3.065. A Record Drawing for the fire service line shall be submitted prior to issuance of the Certificate of Occupancy for the building.

6.110 Backflow Prevention

All water system connections to serve buildings or properties with domestic potable water, fire sprinkler systems, or irrigation systems will comply with the minimum backflow prevention requirements as established by the Washington State Department of Health and the City of Olympia in its Cross Connection Program (Olympia Municipal Code Title 13.04.110).

The installation of required backflow devices is necessary to protect the existing water system and users from possible contamination. All backflow prevention assemblies will be of a type and model pre-approved by the Washington State Department of Health or the City.

No cross connections will be created, installed, used, or maintained within the City of Olympia water service area.

Approved backflow prevention assemblies will be installed at the expense of the user, either at the service connection or within the premises, as determined by the City of Olympia Public Works Cross Connection Specialist in each of the following circumstances:

- A. If the nature and extent of any activity on the premises, or the materials used in connection with any activity on the premises, or materials stored on the premises could contaminate or pollute the potable water supply.
- B. On premises having one or more cross connections.
- C. Internal cross connections that are not correctable or intricate plumbing arrangements that make it impracticable to ascertain whether or not cross connections exist.
- D. A repeated history of cross connections being established or reestablished.
- E. Unduly restricted entry so that inspections for cross connections cannot be made with sufficient frequency or with sufficient notice to assure that cross connections do not exist.

- F. Materials of a toxic, objectionable, or hazardous nature, either liquids, solids, or gases being used such that if back siphonage should occur, a health hazard could result.
- G. Any mobile apparatus that uses the City of Olympia system or water from any premises within the City of Olympia system.
- H. All uniform plumbing codes (UPC) must be maintained.
- I. Assemblies installed at the point of delivery or on the internal plumbing system of any building shall not have galvanized piping attached to the inlet side of the assembly. Rigid piping, such as brass or copper, is allowed on the inlet side.
- J. On any premise where installation of an approved backflow prevention device is deemed to be necessary to accomplish the purpose of these regulations in the judgment of the City of Olympia Certified Cross Connection Specialist.
- K. Any use of radiant heat will require the installation of a reduced pressure (RP) backflow assembly at the meter.
- L. A reduced pressure (RP) backflow assembly is required at all new commercial buildings and will be required to be installed when a change of use occurs at a commercial building. The RP device shall be installed at the meter.
- M. On any premise where an appropriate cross-connection report form has not been filed with the office of the City of Olympia Public Works Department Water Quality Program.
- N. On any premise where a bypass arrangement is installed around a backflow assembly, a second backflow assembly of equal protection shall be installed on the bypass piping.

The City will have the authority to perform regular inspections on all backflow assemblies, both inside and outside any building connected to the City's water system and will be provided access to the premises to inspect.

The Public Works Department must receive and approve the test results of any backflow prevention assembly before releasing the Certificate of Occupancy on any building.

Backflow Prevention Assembly Testers shall hold a current Washington State Department of Health Backflow Assembly Tester Certification.

The Olympia Fire Department will test the fire line and obtain the certificate for underground piping. In any situation, the Olympia Fire Department will not test the fire line until Public Works has tested and approved the main up to the fire line. Backflow assemblies for fire protection shall have integrated shutoff valves approved as part of the assembly and shall be separate from any post indicator valve installed on the fire service line. Double-check detector assemblies shall be required on all fire lines.

6.111 Backflow Prevention Assemblies

Backflow prevention devices for industrial, commercial and multi-family residential facilities shall be readily accessible to the City's Cross Connection Control Specialist, which normally means in an above ground, insulated enclosure adjacent to the right of way. However, in the downtown area and other areas with zero front setback requirements, backflow prevention devices will be allowed within a readily accessible area of the building. See section 6.112 below for more information on location and accessibility.

Double-Check Valve Assembly (DCVA). The term "double-check valve assembly" will mean an assembly composed of two independently acting approved check valves, including tightly closing shutoff valves attached at each end of the assembly, and fitted with properly located test cocks. This assembly will only be used to protect against non-health hazards.

Double-Check Detector Check Valve Assembly (DCDA). The term "double-check detector check valve assembly" will mean a specially designed assembly composed of a line-sized approved double-check valve assembly with a specific bypass water meter and a meter-sized approved double-check valve assembly. The meter will register

accurately for only very low rates of flow and will show a registration for all rates of flow. This assembly will only be used to protect against a non-health hazard. This assembly will be used on all fire protection lines rated as a non-health hazard.

Reduced Pressure Principle Backflow Prevention Assembly (RPBA). The term “reduced pressure principle backflow prevention assembly” will mean an assembly containing two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. The unit will include properly located test cocks and tightly closing shutoff valves at each end of the assembly. This assembly is designed to protect against a health hazard.

Reduced Pressure Principle Detector Assembly (RPDA). The term “reduced pressure principle detector assembly” will mean a specially designed assembly composed of a line-sized approved reduced pressure principle backflow prevention assembly with a specific bypass water meter and a meter-sized approved reduced pressure principle backflow prevention assembly. This assembly will be used on all fire protection services rated as a health hazard.

The meter will register accurately for only very low rates of flow and will show a registration for all rates of flow.

Pressure Vacuum Breaker (PVBA). The term “pressure vacuum breaker” will mean an assembly containing an independently operating, internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with properly located test cocks and tightly closing shutoff valves attached at each end of the assembly. This assembly is designed to protect against a health hazard under a back siphonage condition only.

Spill-Resistant Pressure Vacuum Breaker. The term “spill-resistant pressure vacuum breaker” shall mean an assembly containing an independently operating, internally loaded check valve and independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with a properly located resilient-seated test cock, a properly located bleed/vent valve, and tightly closing resilient-seated shutoff valves attached at each end of the assembly. This assembly is designed to protect against a high health hazard under a back siphonage condition only.

Existing backflow devices that are no longer on the state-approved list of backflow assemblies will be allowed to remain in service provided they pass the annual testing requirements. Backflow assemblies that are no longer approved and do not pass the required testing shall be replaced with a new Washington State approved assembly commensurate with the degree of hazard.

6.112 Backflow Assembly Installation Requirements

Fire suppression systems connected to the potable water system shall be protected by an approved double-check detector check valve assembly as minimum protection. Fire systems using chemicals shall be required to install a reduced pressure detector assembly as minimum protection.

Horizontal and vertical assemblies must be approved by the Washington State Department of Health and the City of Olympia at the time of installation.

To ensure proper operation and accessibility of all backflow prevention assemblies, the following requirements will apply to the installation of these devices:

- A. No part of the backflow prevention assembly will be submerged in water or installed in a location subject to flooding.
- B. Assemblies must be installed at the point of delivery of the water supply, before any branch in the line on private property, in a location approved by the Public Works Cross Connection Specialist.
- C. The assembly must be protected from freezing and other severe weather conditions.
- D. All backflow prevention assemblies to be installed will be of a type and model pre-approved by the State of Washington State Department of Health (Washington Administrative Code 246-290-490) and the City of Olympia Public Works Cross Connection Specialist.

- E. Only assemblies that have been approved for vertical installation by the Washington State Department of Health and the City of Olympia Public Works Cross Connection Specialist shall be used when necessary.
- F. The assembly will be readily accessible with adequate room for maintenance and testing. Devices 2 inches and smaller will have at least a 6-inch clearance on all sides of the assembly. All assemblies larger than 2 inches will have a minimum clearance of 24 inches on the back side, 24 inches on the test cock side, 12 inches below the device, and 36 inches above the device (refer to City of Olympia Standard Drawings). A strainer shall be installed immediately upstream of the assembly.
- G. If written permission is granted by the Public Works Cross Connection Specialist to install the backflow assembly inside of the building, the assembly will be readily accessible during regular working hours of 8:00 a.m. to 5:00 p.m., Monday through Friday.
- H. If, after receiving written permission by the Public Works Cross Connection Specialist, an assembly is installed inside the premises and is 4 inches or larger and is installed 4 feet above the floor, it must be equipped with a rigidly and permanently installed scaffolding acceptable to the City of Olympia Public Works Cross Connection Specialist. This installation must also meet the requirements set out by the US Occupational Safety and Health Administration (OSHA) and the State of Washington Occupational Safety and Health Administration (WISHA).
- I. Reduced pressure principle assemblies may not be installed in a vault underground or anywhere it may be subject to flooding. All installations of reduced pressure principle assemblies shall be above ground with insulated enclosures where needed.
- J. An approved air gap will be located at the relief valve orifice. This air gap will be at least twice the inside diameter of the incoming supply line as measured vertically above the top rim of the drain and in no case less than 1 inch.
- K. Where a backflow device is deemed necessary, the assembly and installation plans will be submitted to the City of Olympia Community Planning and Development Department for approval prior to installation.
- L. Upon completion of installation, the City of Olympia Public Works Cross Connection Specialist will be notified, and all devices must be inspected and tested. All backflow devices must be registered with the City of Olympia Public Works Department Water Resources. Registration with all the required information shall be submitted within five days of installation. Forms must be completed in ink, legible and be an original copy.
- M. The City of Olympia Public Works Cross Connection Specialist reserves the right to reject test reports that are not complete and accurate. Submittal of inaccurate test reports shall result in denial of report forms and a requirement to retest the backflow assembly.
- N. Any deviation from these installation requirements will be requested in writing by the owner and approved by the City of Olympia Public Works Director, or ~~his/her~~ designee, prior to the device installation.
- O. No field modifications shall be made to an approved backflow assembly that will change its configuration or function.

6.120 Service Connection

- A. All service connections relating to new development will be of the appropriate size as determined by the City of Olympia's Public Works and Fire Departments, and installed by the developer at the time of mainline construction. 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 the 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 City will tap the main and install the meter, box, and setter. When available, water service shall be provided by connecting to a water main in the right of way fronting the parcel, before connecting to a water main located in an easement on the parcel.

C. Service lines will be domestic, high-density polyethylene (HDPE) pipe minimum pressure Class 250 psi, Grade PE 4710 iron pipe size (IPS). Service lines will be installed a minimum of 45 degrees off the main. Tracer tape and toning wire wrapped around the pipe shall be installed on all service lines. See Section 6.030.D for tracer tape and toning wire requirements.

Service saddle shall be ductile iron with double stainless steel straps. All clamps will have rubber gaskets. Service saddles shall have tapped IP threads.

Corporation stops will be ball valve all US brass and will be Ford, Mueller, or AY McDonald with IP threads conforming to AWWA C800. Stainless steel inserts shall be used with compression joints and polyethylene pipe.

D. Specifications for meter setters will be as shown on the City of Olympia Standard Drawings.

E. Specifications for meter boxes will be as shown on the City of Olympia Standard Drawings.

F. Other than existing ones with an active water utility account as of December 31, 2015, master meters as defined in OMC 1.04.010 will not be allowed for use in the City of Olympia water system.

6.130 Required Separation Between Water Lines and Sanitary Sewers

The basic separation requirements apply to all gravity and pressure sewers of 24-inch diameter or less; larger sewers may create special hazards because of flow volumes and joint types and accordingly require additional separation requirements. The special construction requirements given are for the normal conditions found with sewage and water systems. More stringent requirements may also be necessary in areas of high groundwater, unstable soil conditions, and so on. Any site conditions not conforming to conditions described in this section will require assessment and approval of the appropriate state and local agencies.

A. Horizontal and vertical separation (parallel). A minimum horizontal separation of 10 feet between sanitary sewers and any existing potable water line and a minimum vertical separation of 18 inches between the bottom of the water line and the crown of the sewer shall be maintained. The distance shall be measured edge to edge. See Figure 6-1 below.

B. Unusual conditions (parallel). When local conditions prevent the separations described above, a sewer may be laid closer than 10 feet horizontally or 18 inches vertically to a water line provided:

1. It is laid in a separate trench from the water line.
2. The elevation of the crown of the sewer line must be at least 18 inches below the bottom of the water line. When this vertical separation cannot be obtained, the sewer shall be constructed of materials and joints that are equivalent to water main standards of construction and shall be pressure tested to ensure watertightness prior to backfilling. Adequate restraint should be provided to allow testing to occur.
3. If sewers must be located in the same trench as a potable water line, special construction and mitigation is required. Both water lines and sewer lines shall be constructed with a casing pipe of pressure-rated pipe material designed to withstand a minimum static pressure of 150 psi. The water line shall be placed on a bench of undisturbed earth with the bottom of the water pipe at least 18 inches above the crown of the sewer and shall have at least 5 feet of horizontal separation at all times. Additional mitigation efforts, such as impermeable barriers, may be required by the appropriate state and local agencies. See Figure 6-2 below.

Figure 6-1

Required Separation Between Water Lines and Sanitary Sewers, Parallel Construction

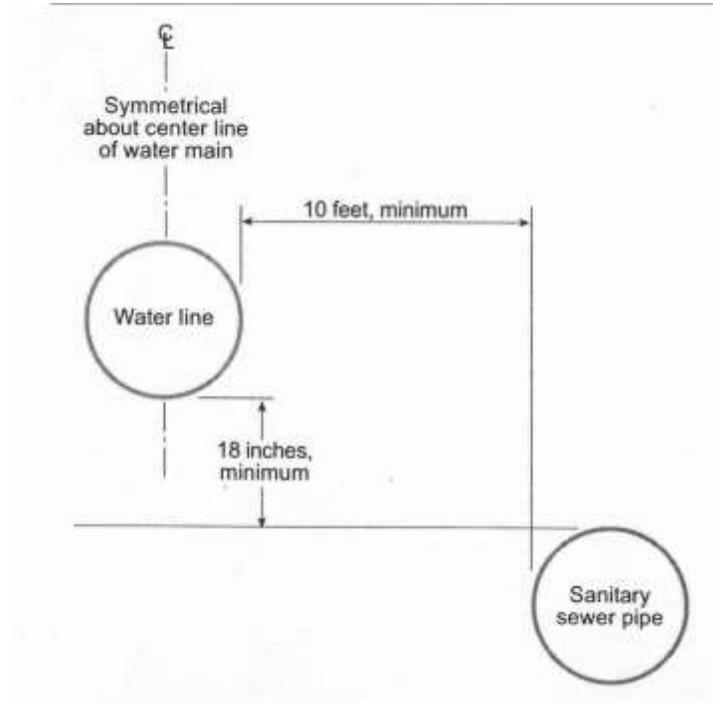
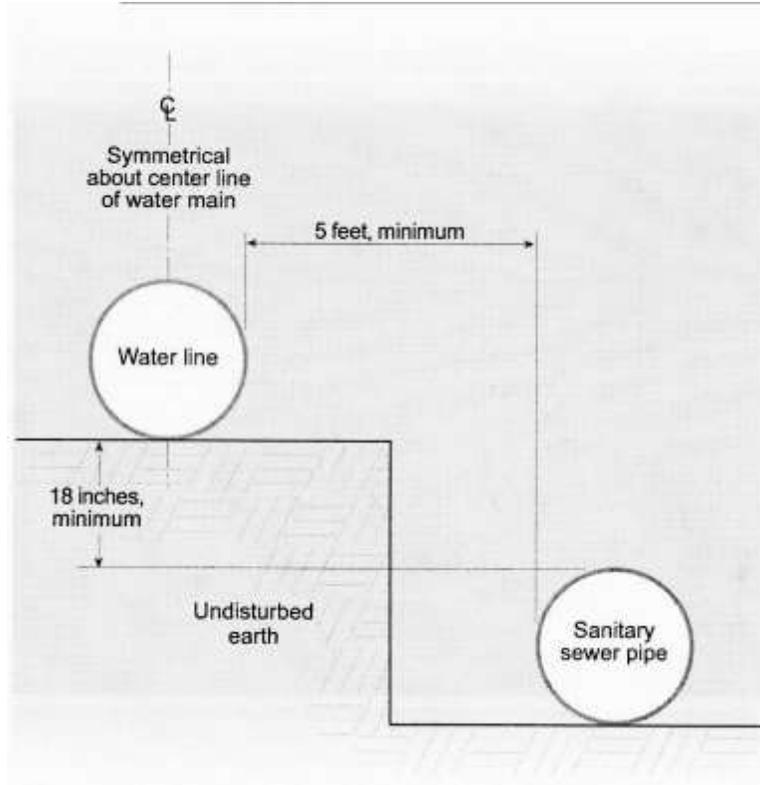


Figure 6-2

Required Separation Between Water Lines and Sanitary Sewers, Unusual Conditions Parallel Construction



C. Vertical separation (perpendicular). Sewer lines crossing water lines shall be laid below the water lines to provide a separation of at least 18 inches between the invert of the water line and the crown of the sewer.

D. Unusual conditions (perpendicular). When local conditions prevent a vertical separation as described above, construction shall be used as follows:

1. Gravity sewers passing over or under water lines. These gravity sewers shall be:
 - a. Constructed of material described in Table 1. The one segment of the maximum standard length of pipe (but not less than 18 feet long) shall be used with the pipes centered to maximize joint separation.
 - b. Standard gravity sewer material encased in concrete or in a 1/4-inch-thick continuous steel, ductile iron, or pressure-rated PVC pipe with a dimension ratio (DR) (the ratio of the outside diameter to the pipe wall thickness) of 18 or less, with all voids pressure grouted with sand-cement grout or bentonite. Commercially available pipe skirts and end seals are acceptable. When using steel or ductile iron casing, design consideration for corrosion protection should be considered.
 - c. The length of sewer pipe shall be centered at the point of crossing so that the joints will be equidistant and as far as possible from the water line. The sewer pipe shall be the longest standard length available from the manufacturer.

Table 1: Water Main Standard Pipe Material

Type of Pipe	AWWA (ASTM) Standard		
	Pipe	Joint	Fittings
Ductile Iron	C 151 and C 104	C 111	C 110
HDPE 3408	C901 and C 906	Fused per C901 and C 906	C901 and C 906

* Pipe spec C900 for pipe up to 12 inches in diameter; C905 for pipe more than 12 inches in diameter.

2. Water lines passing under gravity sewers. Water lines shall be protected by providing:
 - a. A vertical separation of at least 18 inches between the invert of the sewer and the crown of the water line.
 - b. Adequate structural support for the sewers to prevent excessive deflection of joints and settling on and breaking of the water lines.
 - c. The length of sewer pipe shall be centered at the point of crossing so that the joints will be equidistant and as far as possible from the water line. The sewer pipe shall be the longest standard length available from the manufacturer.
 - d. A water line casing equivalent to that specified above in D(1) above.

6.140 Irrigation

All irrigation systems will be installed with backflow prevention assemblies approved by the Washington State Department of Health, and in accordance with City of Olympia installation guidelines. The backflow prevention assembly must be located next to the meter, unless otherwise approved by the City of Olympia Cross Connection Specialist.

Irrigation sprinklers will be situated so as to not wet any impervious surface, such as a public street or sidewalk.

6.150 Surveying and Staking

All surveying and staking shall be performed as required in Chapter 3, section 3.056 of these Standards.

6.160 Trench Excavation

A. Clearing and grubbing where required will 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 will be disposed of by the owner or contractor in accordance with the terms of all applicable permits.

B. Trenches will be excavated to the line and depth designated by the City to provide a minimum cover of 30 inches. Except for unusual circumstances where approved by the City, the trench sides will be excavated vertically and the trench width will be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency. All necessary shoring operations will be performed to ensure that the excavation can be carried out in accordance with WISHA and OSHA safety standards. The trench will be kept free of water until joining is complete. Surface water will be diverted so as not to enter the trench. The contractor will maintain sufficient pumping equipment on the job to ensure that these provisions are carried out.

C. The contractor will perform all excavation of every description and whatever substance encountered, and boulders, rocks, roots, and other obstructions will be entirely removed or cut out to the width of the trench and to a depth 6 inches below water main grade. Where materials are removed from below water main grade, the trench will be backfilled with material satisfactory to the City and thoroughly compacted.

D. Trenching and shoring operations will not proceed more than 100 feet in advance of pipe laying without approval of the City and will be in conformance with WISHA and OSHA safety standards.

E. The bottom of the trench will 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 will be excavated with hand tools to sufficient size to make up the joint.

F. The contractor will maintain the presence of a “competent person”, as defined by the Washington State Department of Labor and Industries, when any trench excavation and backfill work is being done at the project site.

6.165 Thrust Blocking

Location of thrust blocking will be shown on the plans. Thrust block concrete will be Class B poured against undisturbed earth. A plastic barrier will be placed between all thrust blocks and fittings. See City of Olympia Standard Drawings for thrust block locations and calculations.

MJ Mega Lug retainers are the preferred method of thrust blocking. Restraining rods, or Romac Grip Ring Retainers can also be used in lieu of concrete thrust blocking.

6.170 Backfilling

Backfilling will not commence until the pipe installation has been inspected and approved.

Backfilling and surface restoration will closely follow installation of pipe so that not more than 100 feet is left exposed during construction hours without approval of the City. Selected backfill material will 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 will be compacted to 95 percent of the maximum density in traveled areas and 90 percent outside traveled areas. Where governmental agencies other than the City have jurisdiction over roadways, the backfill and compaction will be done to the satisfaction of the agency having jurisdiction. Suitable backfill material, as determined by the City, shall conform to the current WSDOT/APWA Section 7-09 with the exception of gradation of the bedding material to be a maximum size of 1-inch.

6.175 Street Patching and Restoration

See Chapter 4 for requirements regarding street patching and trench restoration.

6.180 Hydrostatic Tests

Prior to the acceptance of the work, the installation will be subjected to a hydrostatic pressure test by the contractor of 225 psi for 15 minutes. See Section 7-09.3(23) Hydrostatic Pressure Test in the current addition of the WSDOT Standard Specifications for Road, Bridge, and Municipal Construction for more detail. Any leaks or imperfections developing under said pressure will be immediately remedied by the contractor. The main will be tested between valves. Insofar as possible, no hydrostatic pressure will be placed against the opposite side of the valve being tested. Test pressure will be maintained while the entire installation is inspected by the City. See Section 7-09, Water Mains, of the current WSDOT Standard Specifications for Road, Bridge, and Municipal Construction for more detail.

The contractor will provide all necessary equipment and will perform all work connected with the tests. Tests will 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 will perform a test to assure that the equipment to be used for the test is adequate, in good operating condition, and the air in the line has been released before requesting the City witness the test. Only authorized personnel of the City of Olympia Public Works Department will operate isolation valves.

See Section 6.110 for testing responsibilities for backflow prevention devices.

6.190 Sterilization and Flushing

Sterilization of the water main will be accomplished by the contractor in accordance with the requirements of the Washington State Department of Health and AWWA Standards and in a manner satisfactory to the City. At no time will chlorinated water from a new main be flushed into a body of water. This includes lakes, rivers, streams, drainage ways, Puget Sound, and any and all other waters where fish or other natural water life can be expected. All dechlorination procedures will meet all local, state and federal regulations. The contractor will provide the City of Olympia inspector a written copy of their plan or procedures to be used prior to the sterilization process.

The new line will be super-chlorinated, valves closed and the line left undisturbed for 24 hours. The line will be thoroughly flushed and filled with system water, valves closed and left undisturbed for another 24 hours. The City of Olympia Inspector will submit a New Construction Sample Request Form to the Water Quality Program. Twenty-four to 48 hours after the request is received from the City of Olympia Inspector, the sample will be collected. If the initial sample fails and bacteria are present, the disinfection procedure will be repeated, starting with super-chlorinating the line. This procedure will continue until the sample passes with no bacteria being present. In addition, if the system water in the line has an elevated pH or free chlorine residual above the expected levels in the

distribution system, the sample will not be collected and the line will need to be flushed, valves closed and left undisturbed for another 24 hours. A fee will be charged for each additional visit to the sample collection site after the initial visit. The sample can be collected Monday through Thursday at the discretion of the sampler. Testing and sampling will take place after all underground utilities are installed and compaction of the backfill within the roadway section is complete.

6.200 Abandonments

At time of abandonment for any service line, the corporation shall be removed and a full circle stainless steel repair band shall be installed.

When a main line or hydrant is abandoned, the abandonment shall occur back to the closest tee or cross, removing the valve and installing a blind flange or plug. In areas where the tees are lead-in fittings, the whole tee will be removed along with a small section of main.

6.210 Asbestos Cement Pipe Abandonment

Asbestos Cement (AC) pipe being abandoned in place shall be filled with “Pumpable Controlled Density Fill (CDF)” using a Line Pumper to place the required mix. For AC pipe larger than 6 inches in diameter, or for any AC pipe located under a paved roadway section, the Contractor shall pothole and window the pipe every 100 feet to verify the pipe is full. Handling of AC pipe shall be in accordance with Department of Labor and Industries requirements.

New water mains and service connections shall be installed and tested prior to AC water pipe abandonment unless otherwise approved by the Engineer.

6.300 Groundwater Monitoring Wells

Requirements for installing a long-term groundwater monitoring well will be determined by Community Planning and Development Department in coordination with the Public Works Groundwater Protection Program during plan review stage. The installation shall be performed by a state-licensed contractor and overseen by a state-licensed hydrogeologist. City of Olympia Groundwater Protection Program staff must be consulted on well site location and City of Olympia Water Quality Program staff must be on site for well installation.

The well shall be completed in compliance with Chapter 173-160 WAC, consistent with City standards and Standard Drawing 6-27. The location of the well, elevations at the top of the well casing, and the ground surface shall be surveyed after well installation is complete. Survey information shall be provided to Public Works Water Quality Program or Groundwater Protection Program staff and shown on the Record Drawing that shall be submitted as part of the pertinent CPD permit.

The depth and location of the monitoring well will be determined based on the site specific conditions. Screening shall be continuous wire wrap stainless steel. The length of the screened section and the slot size shall be determined based on the nature of the soils encountered during drilling. Similarly, the sand filter pack shall be selected based on the soils and well screen. The well shall be developed soon after construction and involve a combination of surging and bailing until the water is clear.

See City of Olympia Standard Drawings for detailed requirements.

6.400 Telecommunications Equipment at Drinking Water Utility Sites

Before any telecommunications equipment is installed or altered at a Drinking Water Utility site, regardless of whether or not it is under a franchise agreement or Master Use Permit, the eventual owner of such equipment shall follow the process described in Appendix 2 of this Chapter. No permit for the installation or modification of such equipment will be issued until written approval is issued under the aforementioned process.

Appendix 1: List of Standard Drawings

Title	Drawing No.	File Type (DWG includes all drawings in chapter)
-------	-------------	---

Title	Drawing No.	File Type (DWG includes all drawings in chapter)
	Chapter 6 – All	PDF DWG
Single Service Connection 1" Diameter to 3/4" Setter	6-1A	PDF DWG
Single Service Connection 1" Diameter to 1" Setter	6-1B	PDF DWG
Single Service Connection for Residential 1" Diameter Fire Sprinklers	6-1C	PDF DWG
Double Service Connection 1" Residential Fire Sprinklers	6-2	PDF DWG
1 1/2" and 2" Standard Setter with Bypass	6-3	PDF DWG
Typical Meter Placement	6-7	PDF DWG
Hydrant Assembly	6-8	PDF DWG
2' Air and Vacuum Release Valve	6-9A	PDF DWG
2" Blowoff Assembly for Dead End	6-10	PDF DWG
2" Temporary Blow-Off Assembly Type "A" and "B"	6-10B	PDF DWG
Connection to Existing Main	6-11	PDF DWG
Standard Valve Box	6-12	PDF DWG
Valve Marker Post and Hydrant Bollard Detail	6-13	PDF DWG
Standard Blocking Detail	6-14	PDF DWG
Thrust Loads	6-15	PDF DWG
Blowoff Sizes for Flushing Pipelines	6-17	PDF DWG
Sampling Station	6-18	PDF DWG
Compound Water Meter with Bypass for 6" and 8" Size	6-19A1	PDF DWG
Material List for Compound Water Meter with Bypass for 6" and 8" Size	6-19A2	PDF DWG
Water Meter Manifold for 3" and 4" Size	6-20A	PDF DWG
Material List for Manifold Water Meters 3" and 4" Size	6-20B	PDF DWG
2 1/2" and Larger Double Check Valve Assembly	6-21	PDF DWG
Double Check Valve Assembly 2" and Smaller	6-21A	PDF DWG
2" and Smaller Reduced Pressure (RP) Installation	6-22	PDF DWG
Reduced Pressure Backflow Assembly 2 1/2" and Larger	6-22B	PDF DWG
Pressure Vacuum Breaker Assembly	6-23	PDF DWG
2 1/2" and Larger Double Check Detector Check Valve Assembly	6-24	PDF DWG
Temporary Residential Construction Water Hookup	6-25	PDF DWG
Spill Resistant Pressure Vacuum Breaker Assembly	6-26	PDF DWG
Resource Protection - Monitoring Well Design	6-27	PDF DWG
Near Building Residential PRV Assembly	6-28	PDF DWG

Title	Drawing No.	File Type (DWG includes all drawings in chapter)
Near Street Residential PRV Assembly	6-28A	PDF DWG
13x24x2 RPM Meter Box Lid	6-29	PDF DWG
17x30x2 RPM Meter Box Lid	6-29A	PDF DWG

Appendix 2: City of Olympia Standards for Telecommunications Equipment at Drinking Water Utility Sites Part 1 - Introduction and Review Procedures

1.0 Introduction

The purpose of this document is to describe the standards for locating and mounting privately-owned telecommunications equipment on City-Owned Drinking Water Utility Sites. The standards described herein are the minimum required. The City reserves the right to impose additional requirements beyond those specifically listed herein. Wireless Telecommunication facilities are also regulated under Olympia Municipal Code (OMC) Title 11 and OMC Chapters 18.44 and 18.46.

All telecommunications equipment located on City-Owned Drinking Water Utility Sites shall be governed by these standards and by the terms of the lease between the City and the Owner of the telecommunications equipment (Lessee).

1.1 Review Procedures

All proposals for installation of new telecommunications equipment or modifications to existing telecommunications equipment on City-Owned Drinking Water Utility Sites (herein after called Sites) shall be submitted to the City Community Planning and Development (CPD) for review and permit approval from CPD prior to beginning any work on the property. (Note that modifications to existing equipment type or location may also require lease modifications).

A. Submittal Format

All submittals shall be in the following format:

1. Plan sheets – 22” x 34” (3 copies)
2. Design calculations – 8 ½” x 11” (3 copies)
3. Reports or studies – 8 ½” x 11” (3 copies)
4. 1 electronic .pdf format file or all submitted items.

B. Submittal Content

All submittals shall include the following information:

1. Plan sheets
 - a. Cover sheet including the following information:
 - i. Project title
 - ii. Name of the site
 - iii. Vicinity map

- iv. Owner and contact information
 - v. Engineer and Surveyor's contact information
 - vi. Sheet index
 - vii. List of proposed radio frequencies to be utilized
 - viii. City of Olympia signature block
- b. Site plans including the following information:
- i. Survey date, datum, and control points. Horizontal datum shall be NAD 83/2011 (2010 Epoch) Washington South Zone (US Survey Feet). Vertical Datum shall be NAVD88 (US Survey Feet).
 - ii. Location of existing site improvements, existing underground utilities, and existing lease boundaries
 - iii. Location of the lease boundary for the proposed improvements
 - iv. Location of any proposed improvements including:
 1. Ground based support equipment
 2. Conduits
 3. Vaults
 4. Pull boxes
 5. Utility services
 6. Fencing, gates and access points
 7. Gravel surfacing or paving necessary for site and equipment access
 - v. Elevation view of ground based equipment
 - vi. Details for trenching and utility installation
- c. Plans, elevations, and sections showing locations and details for any structure or water storage tank mounted equipment including:
- i. Location of existing antennas, conduits, and other telecommunications appurtenances
 - ii. Proposed antennas and repeaters
 - iii. Proposed conduits, junction boxes, and conduit chases
 - iv. Proposed mounting attachments and brackets
 - v. Unwrapped elevations of existing and proposed antennas on the structure or water storage tank.
 - vi. Any areas where RF protection monitoring and protection is required shall be indicated on the plans along with a description of the protection/monitoring required and necessary signage. (If no areas require monitoring and protection a note stating that shall be include on the plans)
- d. All plan sheets shall be stamped and signed by a Professional Engineer licensed in the State of Washington.

2. Design Calculations

a. Design calculations shall be submitted for attachment of all items to the structure or water storage tank. Design calculations shall be stamped and signed by a Professional Engineer licensed in the State of Washington.

3. Additional Supporting Documentation

a. The applicant shall submit information regarding the frequency and direction of the telecommunications signal to be broadcast. The applicant shall submit supporting documentation demonstrating that the proposed telecommunications equipment will not interfere with existing telecommunications equipment on the water storage tank.

b. The applicant shall submit information describing any safety restrictions for personnel working in the vicinity of the telecommunications equipment including safe working distance, duration, and any personal protective equipment requirements.

1.2 Review and Inspection Costs

The Applicant or Lessee shall pay all costs for permits and special inspections of telecommunications equipment projects on City-Owned Drinking Water Utility Sites. All review fees must be paid by the applicant before the CPD will authorize on-site construction work to proceed.

1.3 Site Access and Security

All access to the Site shall be coordinated with the CPD and the Public Works Department (PWD). The Lessee shall provide twenty-four (24) hours' notice prior to requiring access to the site. The day of access to the Site, the Lessee or their contractors shall call the PWD phone line at 360-753-8333, Option 0 (zero), to notify the PWD Pump Station Section of the entry so PWD can acknowledge the Site intrusion alarm. The PWD may at its discretion accompany all visitors to the Site(s) or allow unsupervised access to the site(s). If the Lessee accesses a Site without PWD personnel present, the Lessee shall be responsible for securing the Site prior to leaving the Site.

1.4 Record Drawings

Within 30 days of completing any modifications to telecommunications facilities on a Site, the Lessee shall submit to the CPD Record Drawings documenting the location and type of modifications made at the site. Record Drawings shall conform to sections 3.030, 3.040, 3.045 and 3.065 of the City of Olympia Engineering Design and Development Standards (EDDS). In addition, original sealed Record Drawings shall be on 24-inch x 36-inch or 22-inch x 34-inch sheet size. Original sheets will be monochrome, no shading or color images, ink on good quality white bond paper. Along with two full size paper copies, electronic copies of final, approved Record Drawings shall also be submitted to the City, in two formats: (1) 300 dpi TIF, and (2) AutoCAD compatible file.

1.5 Supporting Utilities

All utilities (electrical, telecommunications, etc.) providing service or support to the Lessee's telecommunications facilities shall be bound by the same requirements for plan approval, site access, and Record Drawings as the Lessee.

1.6 Relocation of Facilities for City Maintenance Activities

Periodically, the PWD will need to complete maintenance activities on its Sites including cleaning and painting of structures and water storage tanks. Some of these activities will impact the operation of the telecommunications equipment. At least 60 days before beginning maintenance activities, the PWD will notify the Lessees in writing to coordinate the maintenance work. If telecommunications equipment needs to be removed from the structure or temporarily relocated, the PWD will provide additional written notice to the Lessee. Within 30 days of receiving written notice to remove or relocate telecommunications equipment, the Lessee shall remove or relocate their telecommunications equipment.

The PWD may provide the option of temporarily relocating the Lessee's telecommunications equipment onto the containment scaffolding during maintenance if such structure will be available. If the Lessee opts to temporarily relocate their equipment onto the scaffolding, the Lessee shall be responsible for the following:

- A. Providing the weight and location of each antenna to be relocated to the PWD within 30 calendar days of being notified of the maintenance activity.
- B. Providing the PWD with any requirements or restrictions for coating their antennas and cabling. If no information is provided, the PWD shall assume that all of the Lessee's equipment can be coated with the coating system selected by the PWD.
- C. Relocating all antennas and cabling from the structure or water storage tank to the scaffolding.
- D. Making any necessary adjustments during construction, coordinating activities with the PWD and the City's Contractor.
- E. Relocating all antennas and cabling from the scaffolding to the structure or water storage tank.
- F. Any and all costs associated with removal or relocation of the Lessee's telecommunications equipment.

Lessee shall have a maximum of seven (7) calendar days to relocate their antennas and cabling from the structure to the scaffolding and another seven (7) calendar days to relocate their antennas and cabling from the scaffolding to the structure. The timeframe for the relocations shall be determined by the PWD.

Lessee shall assure that the PWD is made aware of any restrictions regarding the painting or coating of antennas and cables prior to placing any equipment on a City facility. If no such restriction is provided to the PWD, it will be assumed that no such restriction exists. The City assumes no responsibility for damage to antennas, or other Lessee equipment, due to routine maintenance activities if Lessee does not provide restrictions prior to placing equipment on a City facility.

1.7 Removal of Obsolete and Unused Equipment

Equipment that is obsolete or is no longer being used shall be removed from the Site(s) within 30 days of its ceasing to be used. Following equipment removal from the Site, the Site and any associated facilities shall be restored to their pre-existing condition or better.

For water storage tanks, any damage to the protective coatings on the water storage tank shall be repaired. The repairs shall be conducted using the existing coating system or an equal system approved by the PWD. Repairs shall be conducted by a contractor knowledgeable in coating repair. No sharp edges or surfaces that will be problematic for maintaining the protective coatings shall be allowed to remain. Surface preparation shall be performed to a minimum of the Society of Protective Coatings (SSPC) SP-3 Power Tool Cleaning. All repair work shall be inspected by a NACE Level 3 Coating Inspector, at the Lessee's expense.

Part 2 – Design Standards

2.0 Ground Support Facilities

All ground support facilities shall be located within their allotted easement. Ground support facility structures shall not be located closer than 20 feet from a structure, water storage tank shell, or foundation.

2.1 Conduits and Conductors

- A. Routing on Site

All power and telecommunications conductors on the Site shall be located below ground in conduits or conduit chases. Conduits shall be grouped together to the extent feasible and shall be installed in designated corridors. Conduits shall be installed between 24 inches and 36 inches deep. Conduits shall be routed to avoid or

minimize conflicts with existing utilities. Conduits shall not be installed directly above and parallel to any City water or drain pipe.

B. Routing on Structures (Including Water Storage Tanks)

Conduits and conductors running along exterior wall surfaces shall be grouped together and shall be located in designated covered conduit chases. Conduit and conductor routing on structures shall not obstruct the ability of the PWD to access and maintain the structure. Conduits shall not be attached to ladders.

C. Routing on Water Storage Tanks

Conduits shall not be surface mounted on top of water storage tank footings unless no other route is practical as determined by the PWD. If conduits are routed on top of water storage tank footings, they shall be grouped together in one location and a ramp rated for public works service vehicles shall be installed over the conduits.

On water storage tanks, conduit chases shall be set off from the water storage tank a minimum of 6 inches.

2.2 Antennas

Antennas shall be of the minimum size and minimum number to effectively provide the desired function. Antennas shall be securely mounted to structures.

On water storage tanks, antennas shall be securely mounted to the water storage tank or water storage tank appurtenances such as the water storage tank perimeter handrail. Antennas shall not be mounted to ladders, vents, or access platforms.

2.3 Attachments to Structures

A. General

All antennas, conduits, chases, and appurtenances shall be securely mounted to structures.

B. Water Storage Tanks

Permanent attachments to water storage tanks shall be mounted on stand-off brackets at least 6 inches from the water storage tank. For new water storage tanks, all equipment mounts shall be welded to the water storage tank during construction at locations determined during design. For existing in-service water storage tanks, magnetic mounts shall be used to attach equipment to the water storage tank. Antennas, conduits, and appurtenances shall not be attached to existing in-service water storage tanks by welding or epoxy, unless allowed by the PWD at its sole discretion due to the timing of the next water storage tank recoating. If an existing water storage tank is taken out of service, the PWD may, at its discretion, allow welding to attach to the water storage tank. For any welding to the water storage tank, the Lessee shall be required to repair water storage tank coatings and disinfect the water storage tank to the standard required by the PWD.

Design calculations shall be submitted for the attachment of all antennas, conduit chases and accessories to the water storage tank.

Equipment mounted to the top of the water storage tank shall not interfere with drainage of water from the water storage tank and shall not cause ponding on the water storage tank roof.

2.4 Self-Supporting Structures and Towers

The PWD, at its sole discretion, may allow under CPD-issued permit the installation of self-supporting structures or towers at a Site provided that there is adequate room available to access and maintain existing structures and facilities. For self-supporting structures, the PWD may require specific colors, screening, or landscaping to minimize the visual impact of the structure on the surrounding area.

Part 3 – Construction Standards

3.0 Pre-Construction Meeting

Prior to beginning any work on the Site, the Lessee and its contractor shall schedule a pre-construction meeting with the CPD and PWD to coordinate the work, establish communication protocols, and define work hours.

3.1 Insurance

All contractors and subcontractors working on the Site shall maintain insurance in the types and amounts required for the Lessee as specified in the telecommunications lease. The contractor shall supply a certificate documenting such insurance prior to beginning work on the Site.

3.2 Hours of Work

All construction shall take place between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday. Emergency work or work requiring shut down of telecommunication facilities may be completed outside of these hours with 24-hour written notice to the CPD and PWD.

3.3 Construction Photos

Prior to construction, the contractor shall take comprehensive pre-construction photos of the Site. Following construction, the contractor shall take comprehensive post-construction photos of the Site. The contractor shall provide the CPD with one hard copy of photos in an indexed 3-ring binder and shall supply one digital copy of photos of a flash drive or CD-ROM.

3.4 Underground Utility Location

The contractor shall locate existing utilities on the Site prior to beginning any excavation activities.

3.5 Construction Staking

Prior to construction, the Lessee shall have the lease area boundary and utility corridors staked by a Professional Land Surveyor licensed in the State of Washington.

3.6 Traffic Control and Site Access Control

For construction activities that will impact travel in the public right-of-way, the contractor shall submit a traffic control plan to the CPD for review and approval. For construction activities that will limit or restrict access to areas on the Site, the contractor shall submit a Site access plan to the CPD for review and approval.

3.7 Construction

All construction work shall be completed in accordance with the approved plans. All trenching shall be backfilled at the end of each day. No open excavations shall be left overnight. The Site shall be cleaned at the end of each day. All disturbed ground surfaces shall be restored to their original condition or better.

The contractor shall take special care not to damage any existing structures, facilities, equipment, piping, or protective coatings. Any damage to existing facilities shall be brought to the attention of the CPD and PWD immediately and shall be repaired by the contractor to the PWD's specifications.

For water storage tank sites, the contractor shall take precautions to ensure that dust and debris do not enter the water storage tank vent(s); however, the contractor shall not obstruct air flow into or out of the water storage tank vent.

Lead, Cadmium, and/or Chromium may be present in the existing coating systems on structures. Any work performed on any structure should assume the presence of these metals in the coating system unless determined otherwise by sampling and testing for these metals.

3.8 Labeling

All equipment shall be provided with an identification tag that identifies the owner and provides a unique identifier for the equipment component. Each conduit shall be provided with a conduit ID tag that includes an abbreviation for the conduit owner and conduit number. All equipment and conduit ID tags shall be reflected on the record drawings.

3.9 Final Inspection

Upon completion of the work, the contractor and Lessee shall schedule a punchlist inspection with the CPD and PWD. Based on this inspection the CPD will prepare a list of any items to be corrected. The contractor shall correct any deficiencies identified by the CPD within 14 days. Following completion of any corrective work, the contractor shall request a final inspection from the CPD. When the CPD confirms that all work has been completed to its satisfaction and record drawings have been submitted and approved, the CPD will issue a notice that the project is complete and the construction bond can be released.