

LAKE MERIDIAN WATER DISTRICT

STANDARD SPECIFICATIONS AND POLICY STATEMENT

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LAKE MERIDIAN WATER DISTRICT

STANDARD SPECIFICATIONS AND POLICY STATEMENT

Scope

The intent of this statement of policy is to clarify what action is required by persons seeking to connect to the water system of Lake Meridian Water District.

1. Policy

It is the policy of the District to encourage extension of the existing water supply mains to serve either proposed developments or properties not currently being served that are within the boundaries of the District. Any developer or property owner wishing service will be required to extend the main to the furthest extreme of the property to be served, where it is likely that they will be needed to connect to future mains. Since it is impossible to predict how or when vacant property will be improved, the mains will need to be designed and constructed at the time the property layout is determined and will be designed to serve all property in any proposed development. All water mains shall be designed in accordance with good engineering practice and as outlined herein by a professional engineer and constructed in accordance with the specifications described below.

These extensions (a) may be constructed by the property owner or developer in accordance with these specifications and regulations; OR (b) may be constructed by the District and financed by means of assessments against the property benefited with the limits of a formalized U.L.I.D. (Utility Local Improvement District).

2. Annexation

It is the policy of the District to not serve property which is outside the District boundaries.

Territory adjacent to the District which is not already part of another water district may be annexed to this District in accordance with state law. Information regarding annexation procedures will be furnished upon request.

3. Developer's Extension Agreement

Application for extension of the water supply main to serve either proposed developments or properties not currently being served, shall be made by the owner of the property or his agent, on the form supplied by the District entitled: "*Agreement for Private Developer*".

4. Approval of Application for Extension of Main

Each application shall be considered by the Board of Commissioners of the District and approved or rejected. The owner/developer shall be notified in advance of the meeting at which the application will be considered. After consideration by the Board, the application will be accepted, (or accepted as modified by agreement), or rejected. Notice of the Board's action shall be mailed to the applicant. If accepted, the applicant shall then be entitled to proceed with construction of the water main extension in accordance with the District's standard specifications.

5. Information for Plan Preparation

The owner/developer has two options for preparation of the design plan drawings; (a) District designed facilities; OR (b) developer designed facilities.

Design by the developer shall be completed in strict adherence to the design standards outlined in this policy.

For "scope of work" or cost associated with either "District" or "developer" designed facilities, see form entitled: "*Statement of Development Fees*".

Prior to plan preparation by either the District's or developer's engineer, the developer shall submit a copy of the preliminary plan, approved road plan and storm drainage, sanitary sewer plan, topographic survey and any other plans for underground utilities. Any revision in plans or installed mains caused by any revisions in such plans shall be carried out at the sole expense of the Developer.

6. Water Installer

The developer must recognize that the facilities constructed as part of their project will ultimately become the property and responsibility of the District. The developer must further recognize that the quality of the material and workmanship used in installing these facilities directly impacts the service life of the utility and the operations and maintenance costs of the District. Therefore, the developers shall have all facilities installed by a licensed contractor whose main business is the installation of underground water systems. The contractor shall use only experience, competent, trained workers and shall demonstrate this competence throughout the execution of the work. The District reserves the right to withhold acceptance of the utility until the District is satisfied in its sole discretion that the facilities have been installed according to District policy and these standard specifications, applicable regulatory agency standards, and to the degree of quality acceptable to the District.

7. Relation between Applicant and District

It is expected that the applicant will extend normal courtesies to the District in giving reasonable notice of the time and place of work to be inspected. In particular, the applicant shall:

- a. Notify the District in writing at least 3 days in advance of the time of beginning any construction.
- b. Complete the work, including cleanup, to the point where the work complies with the plans and specifications and is ready for acceptance by the District within the time limit provided.
- c. The contractor shall not operate any gate valves or make any connections to the existing water main without the necessary arrangement with the District. Specific requirements for connection to the water system shall be designed on the plans and subject to the approval of the District.
- d. The contractor shall not remove any meter that has been installed by the District.

8. Design Standards

The following standards apply to the design of the distribution system facilities within the District. Additional requirement may be imposed by the District to meet special conditions.

a. General Requirements

This section outlines standards for design and construction of new water mains in the District. All main construction in the District shall be in accordance with the current comprehensive plan.

Any developer or property owner wishing service to property not currently being served by an existing water main will be required to extend the main in accordance with District policies. Since it is impossible to predict how or when vacant property will be improved, the mains will need to be designed and constructed at the time the property layout is determined and will be designed to serve all property in the development. All water mains shall be designed in accordance with good engineering practice and as outlined herein by a professional engineer and constructed in accordance with the specifications described below.

b. Main Location

The mains must be extended to the furthest extreme of the property to be served where connection to future mains is most like to occur. In addition, the District may require mains to be constructed on more than one, or up to all sides of the property. Loop systems will be a minimum of 8-inch diameter mains. Dead-end mains shall be avoided except where, in the opinion of the District, it would be unreasonable to require a looped system. All dead-end

mains will require a fire hydrant.

c. Main Size

Mains shall be sized in accordance to the Water System Plan or as required to meet hydraulic conditions of the development. Mains shall be sized such that normal maximum velocity does not exceed 10 feet per second.

All mains shall be sized to provide a minimum fire flow of 1,000 gpm in addition to the peak daily domestic requirement except where a higher fire flow is required by King County or other jurisdiction. Fire flow shall be analyzed for particular building construction or in accordance with the land use plan. A minimum of 3,000 gpm fire flow shall be used in all commercial, multi-family and industrial areas if another flow is not specified.

Minimum size in residential and commercial areas shall be 8 inches in diameter. A 4-inch or 6-inch main may be used in cul-de-sacs without fire hydrants where the length of the main does not exceed 300 feet and if it is the District's opinion that there is no reasonable possibility of extending the main now or in the future.

Normal minimum pipe size shall be determined by fire flow requirements for commercial and industrial areas.

Larger mains will be required for higher flow requirements or for mains with long distances between intersecting points. Detailed engineering designs shall be made for each individual system by considering the specific flow requirements and the hydraulic conditions for the development.

d. Fire Hydrants

The District reserves the right to review at their own option, the engineering calculations that are prepared by the developer. As a courtesy, the District will make available any field hydrant test data for use by the developer. All costs for such review shall be reimbursed to the District.

Fire hydrants shall be spaced to comply with King County codes or other Jurisdictions and in accordance with the following minimum requirements:

Residential – Single-Family/Duplex dwellings: Fire hydrants serving single-family dwellings or duplex dwellings on the individual lots shall be located per the following:

King County: Fire hydrants within all jurisdictions need to be spaced a maximum of 600 feet apart. There needs to be a hydrant within 300 feet, vehicular travel distance, of all lots, up to 5 acres, in urban areas. Rural lots between 35,000 square feet and 5 acres do not need hydrants.

City of Covington: Use King County guidelines.

City of Kent: Requires a maximum distance of 600 feet, vehicular travel distance, between hydrants, on single and dual family lots. There is a 300-foot maximum distance requirement, also vehicular travel distance, for multi family lots.

Other Use: Fire hydrants serving any use other than single family dwellings or duplex dwellings on individual lots shall be located not more than 300 feet on center and shall be located that at least one hydrant is located within 150 feet of all structures or uses. Such distances shall be measured along the path of vehicular access.

Any hydrant branch exceeding 50 feet in length shall be 8 inches in diameter. No more than one hydrant shall be installed on any dead-end 8-inch branch.

Note: All hydrants shall have Storz adapters unless local fire authority requires or dictates otherwise.

e. Valves

Valves should be installed at intersections with normal maximum spacing of 500 feet. The District may require additional valves as considered necessary for operation of the system. Auxiliary valves shall be installed on each hydrant branch. Pressure reducing, combination air/vacuum release or other special valves shall be installed as required.

f. Meters

Each single-family residential unit must be separately metered. Each commercial building or multiple family building shall be served with a separate meter. A double check detector assembly shall be installed in all fire protection sprinkler systems used to serve commercial, multiple family or other buildings.

g. Cross Connection

Cross-connection control: The Developer shall comply with all Government and District rules and regulations governing cross connections. Developers shall install and maintain backflow prevention devices required by the District as a condition of acceptance of the extension. All commercial water services shall be protected by an RPBA at a minimum. No branch connections allowed between the RPBA and the meter. See Standard Details 20 and 21.

9. Drafting Standards

Construction drawings shall be plotted on a 22" x 34" sheet signed by a licensed professional civil engineer currently registered in the State of Washington.

All drawings shall be submitted in triplicate to Lake Meridian Water District for approval. At the time of submittal, the developer is required to provide a water system plan approved by the governing authority. Fire Marshal's approval including fire hydrant locations

together with "engineering calculations indicating the water main extension will provide the required fire flow throughout the site."

All drafting shall be completed in AutoCAD 2013. Drafting symbols shall be per District Standards. File medium shall be sufficiently layered so that topographic data, lot lines, text and design details may be easily turned on or off.

Upon completion of construction, the electronic file shall be edited to reflect actual construction conditions and as-built records. The electronic file shall then be submitted to the District and shall become the property of the District. The electronic file shall contain all design data, including topography, lot lines, other utilities and text. Title blocks may be removed.

The as-built drawing shall be plotted on a 22" x 34" mylar and wet-stamped by the design engineer in charge of construction.

Scale: Plan view: 1" = 50' and profile view: 1" = 5'. Profile view shall be provided where the utility requires special design around conflicts.

Standard drafting symbols shown on the attachment shall be used.

10. Materials

a. General

All materials installed within the District shall be construction of the size, type, and class called for on plans and specifications unless specific written approval by the District is given for use of alternate/altered materials.

b. Ductile Iron Pipe

Ductile iron pipe shall conform to AWWA C-151 with either the push-on joint or mechanical joint and shall be Class 52 unless otherwise specified. All pipe shall be restrained joint. Push-on joint pipe shall be restrained with Field-LOK gaskets, or District approved equal. Field-Lok gaskets are acceptable with class 52 pipe only.

The exterior shall be bituminous coated and the interior cement mortar lined in accordance with, AWWA C104, lined to a minimum thickness of 1/16 inch meeting NSF standards for potable water. Gaskets shall be retained in an annular recess to prevent their being displaced by water pressure. Gaskets shall meet the requirements of AWWA C-111 and may be either natural or synthetic rubber unless one specific type is called for in the Special Provisions. Flanges, if called for, shall be class 125 minimum or greater if required by special design considerations.

The pipe manufacturer shall certify in writing that the inspection, and all of the specified tests, for both pipe and gaskets being supplied under this contract, have been made and that the results thereof comply with the requirements of the specifications.

Corrosive soils testing may be required at the Districts discretion and at which point test results shall be submitted to the District for review. In the event that the project is designed by the District, the developer shall be required to provide vehicular access along the pipe route a minimum of 30 days before the start of the water line construction. All costs for testing and coordination shall be considered as reimbursable expenses billed back to the developer.

If corrosive soils are present, all pipe and fittings shall be zinc coated in accordance with ISO 8179, then a bituminous finish coat and the interior cement mortar lined in accordance with AWWA C104, to a minimum thickness of 1/16-inch meeting NSF standards for potable water.

c. Fittings

All mechanical joints shall be restrained. Mechanical joints shall comply with AWWA C111. Flanges shall comply with ANSI B16.1, Class 125. Flange gaskets shall be full face.

Mechanical joint restrainers shall utilize the full circumference of the pipe for restraining and utilize standard MJ gasket and bolts. The mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1. The restrainer shall be Mega-Lug or District approved equal.

Fittings shall be short-bodied, ductile iron and shall comply with AWWA C110 or AWWA C153, bituminous-coated exterior and cement mortar lined, 350-psi minimum pressure.

Adapter flanges for ductile iron pipe shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12. Flange dimensions shall be in accordance with ANSI B16.1, 125-pound pattern. Gasket shall be Buna-N. Setscrews shall be AISI 4140, high strength, low alloy steel. The adapter flanges shall be Uni-Flange Series 400, or equal.

Dielectric insulated unions shall be used to connect dissimilar metals. They shall separate the metals so that the passage of more than one percent of the galvanic current, which would exist with metal to metal contact, is prevented. Unions shall be of the same material as the pipe to which attached, and pressure and temperature ratings shall be no lower than that of the piping system in which it is installed.

If corrosive soils are present, fittings shall be zinc coated in accordance with ISO 8179, then bituminous finished coated on the exterior and cement mortar lined, 350-psi minimum pressure.

d. Fire Hydrants

Hydrants shall conform to the latest revision of AWWA Specification C 502 except as herein modified. Minimum of 5-1/4-inch main valve opening, 6-inch mechanical joint outlet, MEG-A-LUG, Uni-Flange, followers, furnished with 6-inch auxiliary gate valve flanged to main tee and valve box; riser to suit trench depth at each installation. Furnished with break-off flange on barrel and break-off coupling for the stem. Furnished

with two 2-1/2-inch hose ports (National Standard Thread), and one 4-1/2-inch pumper connection (National Standard Thread). Each hydrant shall be equipped with a suitable positive acting drain valve and 1-1/4-inch pentagonal operating nut (counter-clockwise opening). Nozzles shall be fitted with renewable bronze nipples locked in place. The threads on all ports shall be N.S.T. Maintain 3 feet clear between hydrant and property or easement lines. Hydrants shall be Clow "Medalion", Mueller "Super Centurion", or M & H 129S.

e. Gate Valves

Gate valves shall be Clow, Waterous, Mueller, M & H, only. Gate valves shall be ductile iron body, bronze mounted, resilient seat, wedge disc, counterclockwise opening, high-strength bronze stem, double O-ring complying with AWWA C509 or AWWA C515. Gate valves shall be non-rising stem unless otherwise noted. Valves shall be rated at 250 psi minimum working pressure and furnished with either flanged and/or mechanical joints as required. All surfaces, interior and exterior, shall be epoxy-coated in accordance with AWWA C550, meeting NSF 61 standards for potable water.

Valve stem extensions with plate welded to operating nut will be required where operating nut is more than 4 feet below surface. The valve stem extension top shall be installed within 18 inches to 24 inches below finish grade.

"Butterfly" valves may be used with the District's approval.

f. Valve Box

Each buried valve shall be provided with an adjustable cast iron valve box of 5-1/16-inch inside diameter. Valve boxes shall have a top section with an 18-inch minimum length. The valve box shall be Olympic foundry part number 045 or District approved equal.

Valve boxes located in unpaved areas are required to have a minimum 18-inch diameter protective pad poured around the valve box. For valve boxes in paved areas, see Standard Detail 16.

g. Service Connections

Service lines shall be a minimum of 1 inch and shall be Type "K" copper tubing for 5/8 inch x 3/4 inch through 1-inch meter setters. For meter setters larger than 1 inch, service line shall match service meter size. Materials for service connections shall be approved by the District and engineer and shall be as follows:

1. Corporation stops – Ford or District approved equal.
2. Meter setters – Ford or District approved equal.
3. Meter box – For 3/4x5/8-inch through 2-inch meters, see Standard Detail 13.
4. Copper pipe - Type K conforming to ASTM B-88.

5. Service Saddles – Service saddle body shall be cast from ductile iron meeting or exceeding ASTM A 536, Grade 65-45-12. Saddles shall be double strap heavy gauge Stainless Steel per ASTM A 240. Service saddles shall be Type 202S as Manufactured by Romac Industries, Inc. or District Approved Equal.

h. Paint

The following items shall be painted as shown:

Item	Type of Paint	Color	# of coats
Hydrants	Sherwin Williams B55W101 DTM-EN	Pure White	2
Air vacuum release standpipe	Sherwin Williams B55W101 DTM-EN	Pure White	2

i. Bore Specifications

Water line construction that requires installation of bore crossings shall be completed by a contractor whose main business in installing bored or augured crossings. The bore shall provide for a minimum of 2 feet of cover at the invert surface and shall extend a minimum of 2 feet of casing extended beyond the edge of asphalt. Casing shall be of sufficient wall thickness to withstand the boring process and shall not be less than 1/4-inch thickness. The casing shall be large enough to accommodate all joints and supports. Pipe within the casing shall be restrained joint pipe with treated 4 x 4's strapped to the pipe or a fabricated skid.

Casing ends shall be grout sealed upon testing of water line.

j. Back Flow Prevention

Where required or determined by the District, approved backflow prevention devices shall be installed by the contractor or property owner.

The approved back flow prevention shall be listed on the most current copy of the "Accepted Cross Connection Control Assemblies" published by the University of Southern California (USC).

The device shall be installed by an approved installer and shall have a certified test prior to connection to the District's system. The back flow prevention devices shall be tested annually by a State DOH certified tester.

Copies of the test results shall be sent to the District. Any cost for inspections or investigations required by the District as a result of the failure to comply with this requirement shall be billed to the property owner.

Flow Detection/Backflow Protection/Fire Protection Systems

1.0 Detector Double Check Valve Assemblies (DDCVA)

Detector double check valve assemblies shall conform to AWWA C506, or the latest. The detector double check valve assembly shall consist of two internally-loaded check valves, either spring-loaded or internally weighted, installed as a unit, and include a smaller, factory-installed double check valve assembly and water meter in a bypass configuration to detect leakage or water theft. The manufacturer of the detector double check valve assembly shall be listed on the most current copy of the "Accepted Cross Connection Control Assemblies" published by the University of Southern California. The end connections shall be flanged, conforming to AWWA C110.

Test cocks shall be installed and located in accordance with AWWA C506, for both mainline and bypass double check valve assemblies. The outlets to the test cocks shall be plugged.

The detector bypass meter shall be Lake Meridian Water District standard 5/8" x 3/4" remote reading water meter.

2.0 Reduced Pressure Detector Assembly (RPDA)

Reduced pressure detector assemblies shall conform to AWWA C506, or the latest. The reduced pressure detector assembly shall consist of two independently acting, spring-loaded check valves separated by a spring-loaded differential pressure relief valve, and shall include a smaller, factory-installed reduced pressure principle backflow device and water meter in a bypass configuration to detect leakage or water theft. The manufacturer of the detector reduced pressure principle backflow device shall be listed on the most current copy of the "Accepted Cross Connection Control Assemblies" published by the University of Southern California. The end connections shall be flanged, conforming to AWWA C110.

Test cocks shall be installed and located in accordance with AWWA C506 for both mainline and bypass reduced pressure principle backflow prevention devices. The outlets to the test cocks shall be plugged.

The detector bypass meter shall be Lake Meridian Water District standard 5/8" x 3/4" remote reading water meter.

3.0 Double Check Valve Assemblies (DCVA)

Double check valve assemblies shall conform to AWWA C506, or the latest, and shall consist of two internally-loaded check valves, either spring-loaded or internally-weighted, installed as a unit. The manufacturer of the double check valve assembly shall be listed on the most current copy of the "Accepted Cross Connection Control Assemblies" published by the University of Southern California. The end connections shall be flanged, conforming to AWWA C110. Any irrigation service installed after 3/01/2019, will require an approved DCVA as minimum backflow protection.

Test cocks shall be installed and located in accordance with AWWA C506, or the latest. The outlets to the test cocks shall be plugged.

4.0 Reduced Pressure Backflow Assembly (RPBA)

Reduced pressure backflow prevention assemblies shall conform to AWWA C506 and shall consist of two independently acting, spring-loaded check valves separated by a spring-loaded differential pressure relief valve. The manufacturer of the reduced pressure backflow assembly shall be listed on the most current copy of the "Accepted Cross Connection Control Assemblies" as published by the University of Southern California. The end connections shall be flanged, conforming to AWWA C110.

Test cocks shall be installed and located in accordance with AWWA C506. The outlets to the test cocks shall be plugged.

5.0 Backflow Prevention Device Shut-Off Valves

Backflow prevention device shut-off valves 3 inches through 12 inches in size shall be gate valves conforming to Section 10f of these Specifications.

The end connections on shut-off valves 3 inches and larger shall be flanged, conforming to AWWA C110. The shut-off valves shall be the outside screw and yoke (OS & Y) rising-stem type with hand wheels.

Backflow prevention device shut-off valves smaller than 3 inches shall be ball valves with bronze bodies and quarter-turn handles and tapered thread end connections.

A test cock shall be installed on the supply (inlet) side of the upstream supply shut-off valve. The outlet to the test cock shall be plugged.

11. Construction

All work shall be completed in accordance with the Governing Road Agency and the most current edition of the WSDOT Standards and Specifications except as here in modified.

a. Existing Utilities

The Contractor shall be responsible for locating all existing utilities, well enough in advance of the excavation to prevent damage during construction.

Work shall not commence until the contractor has requested and received utility locates from the one-call system.

b. Road Maintenance and Restoration

Construction on the project will be performed on Public roads and rights-of-way and in certain locations, on easements. Construction provisions for these conditions shall be in accordance with the applicable portions of the standard specifications.

The Contractor shall determine the requirements of the governing road agency and WSDOT, for construction utilities on county or state roads before starting construction.

The Contractor shall carefully examine the job site in order to make proper allowance for the work necessary to restore the roads to a condition equal to that which existed prior to water main construction.

The Contractor's responsibility as to road restoration shall include, but shall not be limited to, proper backfill and compaction of excavation, shaping and general restoration of the roadway, restoration of drainage facilities, removal of debris and surplus material, and restoration or protection of private improvements such as fences, mailboxes, driveways and shrubbery.

Trench backfill shall be adequately compacted and meet governing road agency requirements. The surfacing and shoulders shall be restored to a condition equal to that which existed before starting the work, all to the satisfaction of the District and governing road agency specifications.

Where original excavated material is unsuitable for trench back fill, Select Roadway Borrow shall be placed as directed by the engineer. The unsuitable material shall be removed from the site and it shall be the sole responsibility of the developer to dispose of the material.

Compaction of backfill material within the right-of-way shall be 95% maximum dry density as determined by the modified Proctor, per ASTM D1557. Compaction of backfill material within easements which are non-traveled surfaces shall be compacted to 90% maximum dry density as determined by the modified Proctor, per ASTM D1557 unless otherwise detailed on the plans. Trenches which parallel the driving surface may receive native backfill if suitable for meeting compaction requirements and approved by the governing road agency specifications. If native backfill is not suitable, the import of backfill shall meet the current edition of the WSDOT Standard Specifications section 9.03.9(3) for crushed surfacing top course.

All shoulders shall be covered with minimum 2 inches of 5/8 inch minus crushed rock.

Open-cut road crossing or trenches within the traveled roadway shall be backfilled with 100% crushed rock and mechanically compacted in lifts not to exceed 8 inches. Crushed rock shall be 1-1/4 inch minus at the bottom of the trench with 4 inches of 5/8 inch minus at the surface. Compaction of crushed rock shall be to 95% maximum dry density as determined by the modified Proctor, per ASTM D1557. Asphalt patch shall be 2 inches minimum or greater to match existing road cross-section. Asphalt shall be cut back one foot from the trench line before patching. Asphalt meet lines shall be tacked prior to placement and sealed back emulsion after placement. Crushed rock shall meet the current edition of

the WSDOT Standard Specification for Base Course and Top Course. Asphalt shall meet the current edition of the WSDOT Standard Specification for class B asphalt.

Roadway crossings shall have a temporary cold mix patch and shall be maintained until the final asphalt patching is complete.

c. Water Main

The depth of trenching shall be such as to give a minimum cover of 36 inches over the top of pipe for 8-inch and smaller water mains and 48 inches over the top of pipe for 12-inch and larger water mains. Depth of cover at storm ditches shall be a minimum of 36 inches unless provided otherwise on the drawings.

d. Water Service

Service shall pass under storm sewer when required to maintain 3-foot minimum cover over top of service. There shall be not less than a six-inch cushion between the service and the storm sewer.

Service shall be located no closer than 10 feet from power vaults, handholes, and light standards.

Expansion loops are to be held as flat as possible with no reverse grade. Water main service saddle and corporation stop with compression adapter shall be located at approximately 22-1/2° above spring line per the Standard Detail shown in these Specifications.

e. Connecting to Existing Water Mains

The existing water system is owned by Lake Meridian Water District.

Connections to the existing water main shall not be made without making the necessary arrangements with Lake Meridian Water District. Cut ins or connections to existing fittings shall require that the proposed connection be exposed.

48 hours prior to the work, fitting requirements, pipe materials and potential conflicts shall be verified. Work shall not be started until all of the materials, equipment and labor necessary to properly complete the work, are assembled on the site along with scheduling for any disruption in water service. When work is once started on this connection, it shall proceed continuously without interruption and as rapidly as possible until completed. The District reserves the right to require special schedule considerations if the connection requires shut down of service to commercial areas or larger service areas. Shut downs and connections are typically scheduled Tuesday through Thursday.

To avoid connections between the District potable water system and unsafe or newly constructed water systems that have the potential to contaminate the District water system, and to provide optimal cleaning, disinfection and connection procedures for new water mains to ensure safe, potable drinking water for human consumption, the

following procedures shall be done in the following sequence or as directed by the District General Manager or his designated representative.

1.0 Connection to an Existing Water Main

A physical separation between all untested and potentially contaminated water mains (or developer extensions) and the District's existing water system shall be maintained at all times unless the connection is protected by an approved backflow assembly device (minimum DCVA). See District Standard Detail 28. A hydrant meter and an approved backflow prevention device shall be used whenever drawing water from the District's system (see District Standard Detail 28. Hydrant meters and backflow devices may be obtained from the District office located at 27224 144th Avenue SE by completing the forms for a hydrant meter permit and making the required damage deposit. There will be a charge for all water used in accordance with District Resolution No. 588-11-14 pertaining to hydrant meters.

Prior to the new water main being installed, the Contractor has the option of cutting in the connection tee on the existing water main, or providing potable water from another source to provide a temporary water supply. If the Contractor chooses the option of installing the new connection tee, the Contractor shall install new resilient wedge gate valves on all sides of the tee, or as required by the District. A mechanical joint plug with a 2 inch minimum tap and proper blocking shall be installed on the new incoming mainline valve at the new tee, with piping accessible to accommodate filling the new water main.

The Contractor shall notify the District representative a minimum of five full working days before the valve and tee installation is scheduled. This will allow the District employees time to schedule the water main shutdown and notify the customers affected.

2.0 Cubing

Foam cubes shall be inserted into and pushed through the new water main to remove any residue, dirt, debris, obstruction, or possible foreign material in the new water main.

A. The District shall be responsible for supplying the foam cubes to the Contractor based on the water system design as shown on the approved construction plans.

B. The Contractor shall be responsible for acquiring the foam cubes at the District office located at 27224 144th Avenue SE Kent, Washington, and shall install two foam cubes at the initial connection and two foam cubes at each lateral connection six inches in diameter and larger (downstream of each connecting valve), as the new main is installed. This would include all 6-inch diameter lateral runs to hydrants that are longer than two full pipe lengths, or have more than a single joint in them.

C. A mechanical joint cap with a 2-inch minimum tap shall be installed with proper blocking at the initial connection point on the new main with piping accessible to accommodate both flushing and chlorine injection see Standard Detail 28.

D. The District shall retrieve the foam cubes when the Contractor performs the cubing process. All cubing and flushing shall be under the supervision of the District representative.

E. To accommodate the launch and the retrieval of the cubes, the minimum blow-off size shall be 4-inch diameter for 4-inch and 6-inch mains. A 6-inch diameter blow-off shall be installed for 8-inch mains. An 8-inch diameter blow-off shall be installed for 10-inch and 12-inch mains. A 12-inch diameter blow-off shall be installed for 16-inch mains per District Standards.

F. It shall be the Contractor's responsibility to properly dechlorinate and dispose of all flush water per District Standards as well as locating and retrieving any "lost" or missing cubes or partial cubes from the water main.

G. In the event that the initial cubing does not adequately clean the new water mains, the Contractor shall be required to provide additional point(s) for launching and retrieval of additional cubes, and re-cube those sections of main that have debris in them until clean, as determined by the District.

3.0 Pressure and Leakage Test

All new water mains, extensions of existing mains, water system appurtenances and water services shall then be pressure tested for leakage in accordance with Section 7-9.3(23) of the WSDOT Standard Specifications. All water services and appurtenances installed prior to water main testing shall also be pressure tested with the water main. At no time will the temporary water system connection or backflow device remain connected or in place during the pressure test procedures.

4.0 Chlorine Injection

After the Contractor has cleaned the water main by cubing and flushing, the District will inject a liquid chlorine solution evenly throughout the new main and appurtenances for optimal disinfection. The chlorine dosage shall be at a minimum of 50 mg/L and a maximum of 100 mg/l. The Contractor must provide Lake Meridian Water District three working days prior advance notice to perform the chlorine injection. The Contractor must sign a waiver holding the District harmless for any failure of purity samples due to the work performed by the District. Work may be scheduled after hours due to manpower or workload constraints, in which case the Contractor will reimburse the District for any employee overtime associated with the work performed.

The Chlorine shall remain in the main for the time specified according to the procedure used from AWWA Standards C651-99. After the 24-hour disinfection period, the remaining residual throughout the water main and appurtenances shall not be lower than 25 mg/L. The Contractor shall be responsible for dechlorinating and disposing of all flush water.

The following table lists the amount of Chlorine needed to produce 50 mg/L in 18 feet of pipe (one pipe length) for 12.5% Sodium Hypochlorite solution.

Main Diameter	12.5% (Gal)
4"	0.005
6"	0.011
8"	0.019
10"	0.031
12"	0.044
16"	0.078
18"	0.098
24"	0.176

5.0 Bacteriological Purity Samples

Two consecutive sets of acceptable purity samples, taken at least 24 hours apart, shall be collected by the District from all representative points of the new main and appurtenances. District staff will determine appropriate sample points.

District personnel shall take the first bacteriological purity sample(s) a minimum of 24 hours after the chlorine is removed, flushing is completed and the chlorine level is no greater than nor less than the level present in the adjacent distribution system. Water services and other appurtenances installed prior to water main testing shall also be purity tested with the water main. The second set of purity samples shall be taken no less than 24 hours after the first set of samples. A representative background sample of the District water system may be taken from the distribution source at the same time purity samples are taken from the new main.

Note: No water shall be flushed during the incubation periods described above or prior to the purity samples being taken.

It is the District's responsibility to make arrangements to transport the sample(s) to a state-certified laboratory. The Contractor shall be responsible for paying all costs for the purity samples excluding the representative background sample at the distribution source.

Note: Two consecutive samples, a minimum of 24 hours apart, must show no coliform presence before performing final connections to the existing water system. The District representative will receive all laboratory results.

The District staff may be available during normal working hours, depending upon workload, (8:00 am to 4:30 pm) excluding holidays and weekends, to take purity samples, assist with cubing and chlorine injections. The Contractor shall reimburse the District for all associated costs, including labor, vehicles, materials, and overhead charges. Outside of normal working hours, the Contractor shall reimburse the District at the most current hourly overtime rate for labor, vehicles, materials and other associated costs.

6.0 Final Connection(s) to the Existing Water Main

When both sets of purity sample results are satisfactory and received in writing from the state-certified laboratory, and all other District water system standards have been met, the Contractor shall be allowed to connect the new mains to the existing distribution system following District and AWWA standards. It shall be the Contractors responsibility to prevent, at all times, the contamination of the new

and existing water mains with trench water, dirt, debris, or other foreign material.

The District representative must be present to witness the final connection(s) to the existing water system, to turn on and flush the new water system, and to place the new water system and appurtenances into service.

f. Fire Hydrants and Gate Valves

The valves and hydrants shall be set vertically with the valve boxes properly centered and adjusted to fit the finished grade. Where it may be necessary to set a hydrant in cut, the area should be graded and leveled with at least a 3-foot radius around the hydrant. The slopes or fills shall be neatly graded.

g. Water Supply

Water supply for filling, testing and flushing of new mains will be available from the existing system.

Before any flushing is started, the District shall be contacted to determine if sufficient water is available at the particular time. Flushing overnight shall not be permitted.

The District shall require a hydrant meter when water is used for washing streets, driveways, sidewalks, and equipment, etc. A deposit shall be required on said hydrant meter. A minimum service charge and a consumption charge per 100 cubic feet of water used will be billed per District resolution number 588-11-14 pertaining to hydrant meters.

h. Construction Schedule

The Contractor shall submit his construction schedule to the District for approval prior to construction of the project.

i. Concrete Blocking

Blocking and bracing of the pipe and fittings shall be placed so as to secure bearing on the undisturbed earth. The blocking and bracing size shall be approved by the District. Blocking and bracing shall be of sufficient proportions and installed so as to withstand the required test pressure and operating conditions. The District reserves the right to require the contractor to retain a qualified soils engineer to determine adequate blocking size.

Concrete shall be placed in back of all fittings with unbalanced thrust. Pre-cast blocking may be used only if prior approval by the District. Blocking/shackling shall not be covered without authorization from the District inspector. Blocking shall be formed so that bolts, joints, gaskets, and flanges of adjacent joints are clear of the concrete and so that bolts and joints can be dismantled without removing the concrete.

At tees and crosses where future mains connect, a precast concrete brick may be used between fittings and thrust block.

j. Pipe Bedding

When native material at the trench bottom is suitable for pipe bedding, the bottom shall be hand-finished to grade so that the pipe will have uniform support along the barrel and bell. After the pipe is in place, additional hand-selected native material shall be placed and tamped in place around the pipe up to the horizontal diameter of the pipe.

When native material at the trench bottom is stony or otherwise non-uniform, the trench shall be over-excavated from 3 to 6 inches below the specified grade. The Contractor shall then furnish and place a layer of 5/8-inch minus pipe bedding material to the specified grade. After the pipe is in place additional 5/8-inch minus bedding material shall be placed and tamped in place around the pipe up to the horizontal diameter of the pipe.

Pipe bedding material shall meet the current edition of the WSDOT Standard Specifications.

Where the trench bottom is in a material which is unsuitable for foundation or material which will make it difficult to obtain uniform bearing for the pipe, such material shall be removed and a stable foundation provided. Foundation material shall be in accordance with, Class B, of the current edition of the WSDOT Standard Specifications for Class B foundation material.

The portion of the backfill from the horizontal diameter of the pipe to a point one foot above the top of the pipe shall be made with finely-divided earth free from stones larger than 2 inches in diameter. The material shall be carried up evenly on both side of the pipe simultaneously in approximately 6-inch layers and each layer thoroughly compacted with appropriate tools in such manner as to avoid injuring or disturbing the completed pipeline.

k. Water Works Testing

District staff will verify that all air has been purged from all water mains and services prior to pressure testing. The Contractor will then pump up water mains to 150 psi over normal working pressure as determined by accurate pressure gauge on pump. Minimum pressure 250 psi. Let sit 30 minutes. There shall not be an appreciable or abrupt loss in pressure in the 30 minutes. Reduce pressure to 50 psi. Pump up main to "required" pressure and test for 10 more minutes. (Contractor testing gauge may be compared to District pressure gauge for accuracy.)

Prior to calling out the District staff to witness the pressure test, the contractor shall have all equipment set up and completely ready for testing.

l. Disinfection

The pipe and appurtenances shall be disinfected in accordance with Washington State Health Department Standards and Standard Specifications.

Samples will be taken and handled by District personnel only.

12. Final Inspection and Acceptance

The District shall develop a final punch list and will issue to contractor. The contractor shall then schedule a final inspection after all items of the punch list are corrected and/or completed. The District will then perform a final inspection to confirm that the punch list has been satisfactorily completed. Final acceptance of the improvements or meters will not be installed until all items of the punch list are resolved to the satisfaction of the District.

LAKE MERIDIAN WATER DISTRICT

Attachments