

## Exhibit G

# ENGINEERING AND CONSTRUCTION

**TATOOSH WATER COMPANY****DESIGN STANDARDS**

Where special or unique conditions exist, some of the following requirements may be modified at TWC's discretion.

**1. GENERAL**

All extensions to the water system must conform to the design standards of TWC. In general, the Developer is required to construct the water lines through his property in order to allow for future extension, expansion and continuation of TWC's distribution system or for conformance with the Comprehensive Water System Plan. The following items are necessary to meet the conditions.

TWC and its consultants do not insure the correctness of the information supplied to the Developer from TWC's records. The Developer shall verify by survey any information provided by TWC prior to using the information in design or construction.

**A. Plans**

Plans shall be on paper 24 x 36 inch or 22 x 34 inch sheets and one copy set of 11x17. The scale shall be: horizontal 1" = 50' or 1" = 100'; vertical 1" = 10'. Plans shall include a Vicinity Map and location of existing water valves nearest to point(s) of connection of the new water system. The plans shall be sealed and signed by a Professional Engineer licensed in Washington. Enclosed is a sample plan showing a typical water design and standard general notes which are to be included with each plan set. Drafting of plans for TWC shall conform to this example. The plans shall be for the water system only. Water line stationing will be referenced to the roadway or right-of-way centerline.

The construction plans shall be reviewed or prepared by TWC's Engineers. The developer shall submit for review two (2) sets of plans to TWC. Plans of sewer, buried wire service, street design and final plat shall also be furnished to illustrate the relationships of other facilities to the water system. When the plans have been determined to meet TWC standards, then a final set of reproducible plans shall be submitted to TWC. These reproducible plans shall receive TWC's "Plan Review" approval stamp. TWC shall submit the plans to the regulatory agencies for approval. After approvals have been received, a set of plans stamped "Issued for Construction" shall be made available to the developer.

When the Contractor completes the waterline work, the plans shall be revised to conform with construction record as-built drawings, and then one full size 24x36 or 22x34 and one 11x17 paper copy must be sent to TWC along with the digital record drawings in AutoCAD 2010 or higher version.

B. Right-of-Way and Monuments

All rights-of-way in which the water extension is to be made shall be improved prior to preparation of construction plans and installation of the water mains. Permanent private easements shall be not less than twenty feet (20') in width. Public rights-of-way shall be cleared, grubbed and graded in accordance with the requirements of Snohomish County. Monuments disturbed or destroyed shall be replaced at the Developer's expense.

**2. SYSTEM STANDARDS AND REQUIREMENTS**

A. The water distribution main, laterals, and services shall be designed and constructed in accordance with applicable requirements of the Washington Administrative Code (WAC) for public water systems and public water supplies and in accordance with the applicable requirements of the Washington State Department of Health Drinking Water Regulations.

B. As a minimum, it is TWC's policy to have the Developer extend the mainline water system to the front of the most distant lot.

C. Any Developer Extension or connection from a well or other source of nonpotable water shall include installation of a Company-approved cross-connection control device, all in accordance with Company standards, available for review at TWC office.

D. Unless otherwise called for by TWC's Engineer in the specifications and plans, water lines shall be minimum 8-inch diameter cement lined ductile iron pipe, Class 50 or C900 PVC.

The Developer will be required to install the minimum size pipe required to satisfy the flow requirements of the Developer's project and the requirements of the Coordinated Water System Plan of Snohomish County (see Paragraph G below). TWC reserves the right to increase the pipe diameter for present or future needs of TWC. TWC will make this determination. If TWC chooses to implement this option, TWC will pay the difference in installed cost between the cost of 8-inch diameter pipe and the pipe size required by TWC. The Developer shall pay for the costs for pipe 8-inch and smaller.

E. Gate valves shall conform to A WW A C-509, shall have resilient seat and shall be furnished with a fiberglass valve marker. Valve marker shall be painted and stenciled to Company requirements. Valves 10" and over will be butterfly valves.

F. Valve boxes in shoulder of road shall be buried with valve markers located as required.

G. The pipe size shall be selected as indicated by good engineering practice and hydraulic analysis and shall conform to TWC Comprehensive Plan and the requirements of the Coordinated Water System Plan of Snohomish County. Fire hydrants shall be capable of flowing, as a minimum, 500 gpm at 20 psi residual pressure with velocities not to exceed 10 ft. per second.

- H. The minimum cover on water mains shall be three feet unless otherwise approved by TWC's Engineer.
- I. Water side services shall be 200 PSI P.E. pipe ASTM D2239 (3/4" single and 1" double) with brass fittings (see parts list on detail). The service line shall be installed to within 12 inches of property line of each lot and shall be 18 inches below grade to top of meter stop.
- J. Water services shall not exceed 300 feet in length from the meter to the point of use in order to maintain adequate pressure. TWC must specifically approve services over 300 feet in length.
- K. Meter boxes shall be furnished and installed by the Developer.
- L. Casings under roadway for far side services may be required.
- M. Fire hydrants shall conform to AWWA C-502 as provided in Section 02645 of this manual. They shall be spaced at distances appropriate for the type of development with a maximum separation of 660 feet. They shall be painted with two coats of paint to meet Fire Company requirements.

### **3. EASEMENTS**

Legal descriptions for easements to be dedicated to TWC for all portions of the water system, which lie outside of public street right-of-ways, shall be signed and stamped by a professional land surveyor and transmitted to TWC. Easements shall be twenty to twenty-five feet in width, or as required by TWC. An easement may coincide with another utility easement, except that all sanitary sewer lines must be ten feet or more from waterlines and other utilities must be a minimum of five feet from the waterlines. Waterlines shall be located no closer than five feet from the easement edge. There shall be a separate easement provided for each lot that a waterline crosses. These easements are required by TWC regardless of easements recorded with property deeds or plats.

Easements must be approved by TWC prior to water service connection.

### **4. CONSTRUCTION AND INSPECTION**

#### **A. Installation and Inspection**

TWC may refuse acceptance of any portion of the work installed without the Inspector having reviewed the work. TWC must be notified a minimum of two full working days in advance of a firm starting date and time to arrange for and schedule the Inspector. Work must proceed in a continuous manner.

The approved construction plans and specifications shall be followed. No deviations will be allowed without request for change and approval received from TWC. TWC reserves the right to order changes in the event of conditions or circumstances discovered during construction; such changes could result from the ability or care shown by the Contractor, natural and man-made conditions, or any other reason.

The Contractor shall exercise extreme care in checking and cleaning all pipes and fittings of dirt, debris, and/or any foreign matter during installation. All material shall be kept clean. Plugs shall be used to seal system installed when it is to be left for any period of time, including lunch breaks, coffee breaks, and overnight. Pipe and fittings will be cleaned before installation if contaminated by dust, smoke, exhaust or any other material. Material contaminated by petroleum products or questionable chemical will be rejected. No trench water is to be allowed to enter installed system.

All taps of existing Company mains must be performed while TWC Inspector is present.

TWC will not permit final tie-in to the existing Company system until after acceptance of the entire installation. Acceptance will not be made until all submittals required are completed and after acceptable system installation is complete. A small tubing (3/4 inch to maximum of 2-inch size) connection may be made from TWC system to supply water for line filling, pressure testing, sterilization and sterilizing water removal. An approved backflow preventer installed in the 3/4 to 2-inch supply line will be required.

The entire water system shall be hydrostatically pressure tested as in accordance with Specification Section 02660, Waterlines, of this manual. The Contractor shall provide all testing equipment. The final testing shall be performed in the presence of TWC's Inspector.

Before being placed into service, all new water mains and repaired portions of or extensions to existing mains shall be disinfected in accordance with Specification Section 02660, Waterlines, of this manual.

After all pipe has passed pressures and bacteriological testing, the Developer will install water service lines across streets and to common lot corner locations. The service lines will be connected to the pipelines and extended to lot lines with a tail piece extended from the ground. Meter boxes will not be installed until lot frontage grades are established and water service actually applied for. Time must be allowed before placing road base gravels to permit the digging of the service line trenches. The Developer may dig the trenches if desired to expedite the work, and tubing will be installed without connecting to the main if testing is not complete.

The Developer shall install pressure reducing valves when line pressures exceed 80 psi. At the Developer's request TWC will calculate or measure the water pressure at the Developer's point of delivery as an aid to determining whether a reducing value is required. Pressure reducing valves, when required, must be maintained by the Developer.

B. As-Built Drawings

When the Contractor completes the waterline work, the plans shall be revised to conform with construction record as-built drawings, and then one full size 24x36 or 22x34 and one 11x17 paper copy must be sent to TWC along with the digital record drawings in AutoCAD 2010 or higher version. Prior to submitting revised plans, valve and blowoff location and horizontal alignment shall be verified by a professional land surveyor. The location and type of all installed fittings shall be shown relative to monuments, lot comers, etc. Where butterfly valves are used, the location of the operating nut relative to the pipe centerline shall be shown.

## STANDARD GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE RULES AND REGULATIONS OF TATOOSH WATER COMPANY, WHICH ARE CONTAINED IN A BOUND VOLUME ENTITLED "DEVELOPER PROJECT MANUAL".
2. TWC SHALL BE NOTIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL TESTING AND CONSTRUCTION SHALL BE INSPECTED BY TATOOSH WATER COMPANY.
3. TYPICAL WATER SERVICE TO BE 200 PSI P.E. ASTM D2239 (3/4" SINGLE AND 1" DOUBLE SERVICE).
4. WATER MAINS ARE TO BE CLASS 50 CEMENT LINED DUCTILE IRON, OR C900 PVC SIZE NOTED ON PLANS.
5. SIDE SERVICES SHALL BE LOCATED TO PROVIDE WATER SERVICE ON OPPOSITE SIDE OF LOT FROM SEWER STUB LOCATION.
6. ALL VALVES ADJACENT TO TEE OR CROSS SHALL BE FLANGE CONNECTED.
7. ALL VALVES SHALL BE FURNISHED WITH A CONCRETE VALVE MARKER.
8. LOCATIONS SHOWN ON EXISTING UTILITIES ARE APPROXIMATE. IDENTIFICATION, LOCATION, MARKING AND RESPONSIBILITY FOR UNDERGROUND FACILITIES OR UTILITIES IS GOVERNED BY THE PROVISIONS OF CHAPTER 19.122, REVISED CODE OF WASHINGTON. SEE SECTION 02760 OF SPECIFICATIONS.
9. PLAN AND PROFILE INFORMATION AS FURNISHED BY THE DEVELOPER OR HIS ENGINEER.
10. MINIMUM SEPARATION OF POTABLE WATER MAINS AND SANITARY SEWER LINES SHALL BE TEN (10) FEET HORIZONTALLY FOR PARALLEL PIPE, AND THREE (3) FEET VERTICALLY FOR PERPENDICULAR OR OBLIQUE CROSSINGS, MEASURED FROM OUTSIDE EDGE TO OUTSIDE EDGE. SITUATIONS OCCURRING WITH LESS THAN MINIMUM SEPARATION WILL REQUIRE CONSTRUCTION IN ACCORDANCE WITH SECTION 2.41 OF THE "CRITERIA FOR SEWAGE WORKS DESIGN" PUBLISHED BY THE WASHINGTON STATE DEPARTMENT OF ECOLOGY AS REVISED OCTOBER 1985.
11. WHILE CUTTING OR WORKING WITH ASBESTOS CEMENT PIPE, ALL FEDERAL, STATE AND LOCAL REGULATIONS MUST BE OBSERVED.

NOTICE:

CAUTION -- EXTREME HAZARD -- OVERHEAD ELECTRICAL SERVICELINES ARE GENERALLY NOT SHOWN ON THE DRAWINGS. ELECTRICAL LINES SHOWN ON THE DRAWINGS ARE LOCATED BY POINT -TO-POINT, POWER-POLE-TO-POWER-POLE CONNECTION. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXTENT OF ANY HAZARD CREATED BY OVERHEAD ELECTRICAL POWER IN ALL AREAS AND SHALL FOLLOW PROCEDURES DURING CONSTRUCTION AS REQUIRED BY LAW AND REGULATION. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL MEET WITH UTILITY OWNERS AND DETERMINE THE EXTENT OF HAZARD AND REMEDIAL MEASURES AND SHALL TAKE WHATEVER PRECAUTIONS MAY BE REQUIRED. SEE SECTION 02760 OF SPECIFICATIONS.