Appendix G

POLICIES AND STANDARDS

Proposed Satellite System Management Program

SATELLITE MANAGEMENT NOTICE OF INTENT

Applicant Name (Name of entity/organization):	City of Tumwater
Address of Applicant:	555 Israel Road SW
	Tumwater, WA 98501
Name of Contact Person:	Dan Smith
Title of Contact Person:	Water Resources Program Manager
Phone Number of Contact Person:	360-754-4140
County(ies) for whom the applicant is seeking approval:	Thurston
Submittal Date:	August 09, 2010
	
	Signature

City of Tumwater

Proposed Satellite System Management Program

December 2009 Update

Dan Smith, Water Resources Program Manager
December 15, 2009

CONTENTS

SATELLITE SYSTEM MANAGEMENT

INTRODUCTION

The City of Tumwater in Thurston County currently does not function as a regional Satellite Management Agency (SMA). The City would like to develop a satellite system program, which, through either ownership or contracting for a variety of services, would provide for operation and maintenance of small and large water systems. By operating multiple water systems, economies of scale make it possible to (1) employ qualified personnel, (2) provide good system management and operation, and (3) meet stringent standards required by the Safe Drinking Water Act.

Driven by expanding state and federal requirements, the regulations and liability associated with providing adequate water service are becoming too complex, restrictive, and expensive to be fulfilled by many communities, homeowners associations and individually owned systems. Small private water systems are often unable to develop and sustain a revenue base that will finance needed capital improvements and operational/maintenance activities in a manner that is affordable to their customers. As a result of these concerns, in 1995, the Washington State Legislature passed Engrossed Second Substitute Senate Bill 5448 (E2SSB 5448).

The bill stated that no new water system may be approved or created unless either:

1. It is owned or operated by a SMA established under RCW 70.116.134, or
2. An SMA is not available and it is determined that the new system has sufficient management and financial resources to provide safe and reliable service.

Further, the bill stated that any new system that is not owned by an SMA shall be conditioned upon either:

1. Future management or ownership by an SMA, or
2. Upon periodic review of system operations by DOH.

The Satellite Management program will enable an existing system to negotiate a level of service that will best accommodate their particular needs. Proposed new water systems within the Tumwater UGA will either 1) be owned and operated by the City, 2) enter into an agreement for Operations and Management with the City, or 3) be allowed to form a new separate water system. The choice of which option is selected is determined through the North Thurston County UGA Coordinated Water System Plan process. As areas annex to the City, the City shall approach existing water systems in those areas to discuss the feasibility of a satellite ownership or arrangement by the City.

In addition, the City's eligibility for state and federal funding assistance (Centennial Clean Water Fund, State Revolving Funds, Public Works Trust Fund, Community Development Block Grant (CDBG), Toxics Grants), and its ability to issue bonds help to assure reliable and high quality service at minimum cost for City owned systems. The City also has experience and authority in assessing connection fees and surcharges. If necessary, a Utility Local Improvement District (ULID) may be formed to finance system improvements.

Thurston County currently has seven (7) authorized Satellite Management Agencies. The City currently is not a Satellite Management Agency, and as such does not own and operate any separate water systems.

AUTHORITY

Statutory authority for the development of regulated satellite management programs arises from Chapter 70.116 RCW and Chapter 246-293 WAC (Public Water System Coordination Act of 1977 and regulations adopted pursuant to it). Chapter 246-295 WAC is the satellite management regulation.

Thurston County formally adopted an area-wide Supplement implementing the Public Water Supply Coordination Act (Chapter 70.116 RCW) in January 1986. The Supplement was approved by the Washington State Department of Social and Health Services effective January 29, 1986.

An update of the Supplement was adopted by Thurston County and the cities of Lacey, Olympia and Tumwater in 1996.

The City is not identified currently as a Satellite System Management Agency by Thurston County. The City is likewise not on the current DOH approved Satellite Management Agency list dated June 2009.

The 1995 Legislature passed Engrossed Second Substitute Senate Bill 5448 (E2SSB 5448). The bill requires all new systems to be owned and/or operated by DOH 'approved' SMA's.

The City seeks Satellite Management Agency approval based on the proposed program described below.

SATELLITE SYSTEM MANAGEMENT PROGRAM SERVICES

OVERVIEW

The proposed Satellite Management Program provides three primary options of operation and assistance services for water systems:

1. Ownership – complete ownership and operation by the City.
2. Management and Operations – day to day system operation and maintenance, water quality monitoring, troubleshooting, emergency response, and other routine tasks for systems not owned by the district. Satellite management and operations does not include addressing legal issues, financing or rate setting.
3. Contract Services – a written agreement (contract) for specific needs of a water system not owned by the City. Types of contract services may include water quality monitoring, billing, emergency response, record keeping, meter reading, etc.

These three service options are designed to respond to differing water systems and to support a comprehensive program of water system management and assured reliability throughout the City. Decisions on establishing a level of service will depend on individual system needs, plans for improvement, and growth pressures, as well as the ability of the City to provide desired service in a cost effective manner. Each situation will be carefully examined by the City and the applicant interested in satellite system service.

Transferring an existing system to City ownership may entail specific financial or regulatory liabilities for systems that transfer ownership. The interests of all City water system ratepayers, therefore, must be considered for any proposed action. The City will take ownership or perform management and operations service only for systems that comply with its minimum health, safety, and security standards. Systems failing to meet minimum standards must be brought up to standards in accordance with City Satellite

Management policy. Systems which will be transferred to City ownership (Ownership) must also meet minimum construction and reliability standards. Different criteria will be applied for Group A and B systems as appropriate.

The City recognizes that there are costs associated with any of these options, and that the circumstances will vary depending on the system. It is the intent of the City to be flexible in allocating responsibility and identifying financing mechanisms for those costs, in order to maximize the benefits to the City and the applicant system. For that reason, all of these issues will be negotiable so long as the City's authorities' interests and responsibilities are met.

The City will provide assistance only to those systems that can permit unrestricted access by City staff to system facilities. All system facilities must be located on rights-of-way or easements, or have the appropriate legal authority needed to conduct service in an unencumbered fashion.

The attached Flow Chart for SMA Decision-making presents a diagram of service application and review procedures, described below, which the City uses in evaluating requests for implementing any of the three service options. There are some common steps involved in the process regardless of which service is being requested. They are as follows:

- Initial contact between the applicant and the City: During initial contact, applicants can discuss needs with the City and receive a copy of specific policies and procedures which pertain to their requests.
- The applicant's written letter of request will initiate the City's formal evaluation of system needs, capabilities, and deficiencies.
- The City will then request specific data or background information (Water System Data Request) needed to survey the water system and evaluate the City's ability to implement one of the three service options.

For new systems, the Coordinated Water System Plan (CWSP) process will be utilized to determine which option will be selected. Those new systems that the City agrees to own or provide operations and maintenance will submit all planning and permitting actions through the County, if they are in the County; or if they are within its political boundaries, through the City.

OWNERSHIP

Ownership requires the transfer of system ownership and operational responsibilities from either an existing or new system to the City. The Ownership option enables the City to assume complete responsibility for water systems at any location throughout its Coordinated Water Supply Service Area (CWSSA) and is the preferred option for the City. Water systems within the CWSSA will be approached by the City regarding the feasibility of a satellite ownership or management arrangement. Under the Ownership option, the applicant and system customers are subject to the General Terms, Conditions, and Policies; the Technical Standard and Specifications; and the Extension Policies of the City. Acquisition may be by purchase, sale or by other arrangement acceptable to the parties. Connection charges, water rates and other standard charges may be imposed in accordance with the city's most current schedule of charges and fees. Depending on the amount of system upgrade work and other expenses associated with system transfer to the City, an additional

assessment may be levied or the applicant may be required to undertake improvements as directed by the City, prior to provision of service by the City.

POLICY AND PROCEDURES

The policy and procedures for implementing the Ownership option are as follows:

1. Ownership can be provided for both Group A and B Systems.
2. Systems that are certified at the time of application to meet City, Thurston County Health District, and Washington Department of Health (DOH) standards during construction will not be subjected to the survey and upgrade process. Systems that may desire Ownership from the City at some point in the future will meet the following requirements during design and construction:
    - Group A The system must be designed and constructed in accordance with the Technical Standards and Specifications of the City.
    - Group B The system must be designed and constructed in accordance with standards contained in the Group B Water System Work Book published by the Department of Health.
    - For both Group A and Group B systems, systems may be required to make improvements, at their cost, to meet City standards, prior to service being provided by the City. The design and monitoring of construction of either new system must be coordinated with the City.
    - Prior to transfer of ownership of a new system to the City, a licensed engineer who is the designer of the system must certify that it has been built in accordance with a City-approved design.
3. For systems that are not currently certified as being constructed in accordance with City standards, a survey and engineering evaluation will be conducted and a schedule will be developed to accomplish system upgrades which are required to meet applicable city, local, state, and federal standards. Certain improvements, especially deficiencies related to water quality, safety and system reliability, will be required to be completed prior to or in conjunction with system transfer to or service by the City.
4. Capital improvements will be financed by the applicant/customers of the system to be transferred, through rate surcharges, customer assessments, and system development charges. City support for financing options may be available, including co-signing for state and federal grants, cash contributions, ULID bonds, or similar financing arrangements. However, existing City ratepayers will not pay for system upgrades required to bring the system up to City standards. A special rate for customers of the system may be established to allow for pay-back of improvements over a period of time.
5. Major system improvements may require the formation of a ULID or similar financing arrangement.
6. An estimate of the cost and a mechanism for financing of required capital improvements will be provided to and agreed upon by the existing customers of the system to be transferred, before the City assumes ownership or operational responsibilities. All systems not installed under the certification process outlined above will be handled on a case-by-case basis to determine charges for the preliminary survey and engineering evaluation.

7. The City attorney will establish the appropriate authorization and legal instruments required for the transfer of system ownership to the City.

REVIEW AND APPROVAL PROCEDURES

1. The City will participate in initial meetings with the applicant, and will conduct a preliminary site visit free of charge. The City may require a deposit for preliminary survey and engineering work associated with establishing direct service for a water system, before it will start the complete evaluation and upgrade process. The preliminary survey will establish the system's capabilities, deficiencies, and regulatory and operational needs. The survey will also determine the estimated costs of needed system improvements, and anticipated operation and maintenance expenses. A Preliminary Survey Checklist is attached.
2. A meeting or other agreed upon communications will be used to review the survey results and preliminary cost estimates with the applicant and/or customers of the system to be transferred. The applicant may either withdraw the request for Ownership or continue the process by authorizing the City to prepare an engineering evaluation to more accurately determine the work and costs required to bring the system up to required standards.
3. The City engineering evaluation may include detailed analysis of the system's operation, required capital improvements, and projected cost of operation and maintenance. It will also contain a preliminary financing plan for improvements and proposed rate structure based on:
    - Minimum improvements required to meet quality, safety and reliability standards.
    - Improvements required to upgrade the system to the Technical Standards and Specifications of the City.
    - Source, storage, metering, fire flow and other desired improvements.
    - Ability of system to meet state financial viability test requirements.
4. If substantial costs may be incurred in the engineering review process, the City may charge for those costs, as negotiated with the applicant. If engineering review will exceed a nominal cost, as determined by the Public Works Director, staff will bring the item forward for discussion at Public Works Committee.
5. After a review of the engineering evaluation is conducted with the applicant and/or customers, the applicant may withdraw the request for service; however, if the applicant withdraws at this point (i.e., after the City engineering evaluations), the City may require that applicants reimburse the City for actual costs. This reimbursement would be deducted from the initial deposit, if any has been made (See Item (1) above); any balance remaining from the initial deposit would be refunded to the applicant.
6. Improvements required to upgrade the system to City standards (particularly those associated with quality, safety and reliability), will be completed prior to or in conjunction with system transfer. If the City and the applicant agree, some improvements may be deferred until normal repair or replacement occurs. This agreement shall be incorporated in writing into overall contracts for services or transfer agreements by the parties.
7. When capital costs for necessary improvements can be financed within a reasonable time period by applicant and/or customers of the system to be transferred, then the transfer of ownership may be

completed by written instruments. A list of items to accomplish a transfer of ownership may include but is not limited to:

- Bill of Sale
- Title Report and Property Deeds
- Assignment of Easement and Franchises
- New Easements, if required
- Assignment of Water Right applications or Permits
- Water Right Transfer or Change Agreement
- Hold Harmless Agreement
- List of Owners, Customers and Addresses
- Maps, Records, Equipment Manuals and Data, and Other Information

8. The transfer must be approved by a majority of persons who will be ratepayers under the new arrangements to support the capital improvement needed.
9. If necessary and found to be feasible, the City Council or county commissioners may form ULID in accordance with Chapter 54 RCW. Once a ULID is formed, ownership of specified facilities, equipment and data will be transferred to City ownership.
10. New systems whose initial design, construction and approval have been conducted in accordance with the City's design standards and inspection requirements may not require a preliminary survey or engineering evaluation. The transfer of ownership can occur either contractually or by ULID formation as described in paragraphs (6) and (7) above, respectively. The system must be certified in accordance with WAC 248-54 to verify that it was built and approved in accordance with the requirements of the Washington State Department of Health (DOH), Thurston County Health Department and the City prior to transfer of ownership.

MANAGEMENT AND OPERATIONS PROGRAM

Major limitations on proper operation of any utility are the availability of funds and access to qualified professionals. The Management and Operations program enables the City to provide professional support to existing or new systems at a cost-effective level to improve system operation, reliability and compliance with state and federal requirements. Qualified City staff can provide a variety of services throughout the Critical Water Supply Service Area (CWSSA) to either individual or community systems.

In conducting satellite management and operations, the City will be responsible for all day-to-day responsibilities of a water system. Management responsibilities include planning and policy decision making. Operational responsibilities include normal day-to-day operations, preventative maintenance, water quality monitoring, troubleshooting, emergency response, response to complaints, public/press contact and record keeping. Responsibilities do not include addressing legal issues, financing or rate setting.

As part of the agreement of operate the system, the City may require that it be given right of first refusal or option to purchase the system in the future.

A Management and Operations contract (sample attached) will be utilized to establish the City's and the water system owner's responsibilities.

POLICY CONSIDERATIONS

Listed below are the major policy and procedural considerations for City Management and Operations

1. System improvements may be required to eliminate deficiencies associated with system reliability, safety and water quality. Improvements required by the City will be completed prior to the City initiating service unless the City agrees to accomplish improvements as a part of the contract.
2. Management and Operation services will be limited to systems where such services are cost effective for the City.
3. Financing for system improvements is the applicant's responsibility although, the City may provide assistance where authorized and appropriate.
4. The City will only provide services to systems where facilities are located on public rights-of-ways, utility easements, or where authorization for unrestricted access to all facilities that may require servicing, maintenance, repair or replacement can be obtained.
5. If the applicant intends to expand the system's service area, the City must approve of the expansion and/or be given the option to discontinue contract services.
6. The applicant must designate a reasonably available individual to be an official contact with the City.
7. The City must receive, as appropriate, the legal authority from the applicant to contract, assess costs and be held harmless from liability, for service activities during the normal course of operations.
8. The City may require that the applicant agree to a right of first refusal or option to purchase in favor of the City, as a condition.

REVIEW AND APPROVAL PROCEDURES

1. Once applicants have requested Management and Operations assistance, they may be required to pay a fee to the City for the cost of conducting a preliminary system survey. If required, the City should receive this survey fee and all requested system data before the City will conduct a preliminary survey of the system. The survey is designed to identify all existing material defects, public health deficiencies and operational problems.
2. The City will provide the applicant with a planning level assessment of all required improvements, with an estimate of the costs associated with those improvements.
3. After reviewing the survey results and evaluating the cost estimates, the applicant may either withdraw the request for Management and Operations Service or authorize the City to establish firm costs for the particular category of requested service. When determined, firm costs will be reviewed with the applicant and/or customers of the system seeking services.
4. If the costs are acceptable, the applicant will complete specified system improvements and enter into a contract with the City which specifies the details, frequency, duration and costs of the service program (sample attached).
5. System improvements will be the responsibility of the applicant through the term of the contract except as agreed to by the parties on a case-by-case basis.

CONTRACT SERVICES PROGRAM

The Contract Services Program provides for general assistance for improving water utility service within the Critical Water Supply Service Area. Primarily the program is designed to support and assist smaller water utilities. Services are proved by the City to water systems through a written agreement (contract) for specific tasks.

Contract Services vary with the specific needs of the water system. Types of contract services may include water quality monitoring, billing, emergency response, record keeping, meter reading, operator training, information system support and purchase of equipment and supplies on a cooperative basis. Volume buying can reduce many of the costs of operating a small water utility.

There are several categories of services which the City can provide on a one-time basis. Cost associated with providing these services can be established on a time and materials basis or through a lump-sum contract. Examples of services might include:

- Loan equipment or supplies to a system to handle a special circumstance.
- Provide engineering and/or technical expertise to a system that lacks necessary staff for certain tasks
- Provide financial management/grant procurement assistance.
- Develop water system maps.

In addition, there are several categories of continuous service that the City may provide including, but not limited to:

- Administration of programs for joint purchasing of equipment and supplies to achieve economies of scale for smaller utilities.
- Technical support programs for operator training.
- Conduct water quality compliance or engineering sampling.

CONTRACT SERVICES PROGRAM POLICY CONSIDERATIONS

The contract service program relationship is one that will not affect a utility's wish to remain autonomous and operate at existing expenditure levels. The City is willing to evaluate any form of assistance to help utilities improve their level of service inside the UGA.

REVIEW AND APPROVAL PROCEDURES

1. The City and the applicant will execute either a formal contract or written agreement which will specify the exact responsibilities, staff, equipment and other details required of the City in providing assistance.
2. A service contract is utilized to establish the frequency, duration, cost and specific responsibilities of the City in performing services. Services can be contracted on a continuous basis to provide routine system operation and maintenance, periodic well performance monitoring, required water quality

monitoring, periodic equipment maintenance, scheduled repair activities, on-call emergency assistance, water rate billing services and/or other tasks.

3. Once the services are decided on, a contract (agreement) is written and signed (sample attached).

POLICY DIRECTIONS TO SUPPORT RATIONAL WATER SYSTEM DEVELOPMENT IN THE CWSSA

RESERVATION OF WATER SUPPLIES

The Reservation of Water for Future Public Supply (WAC 173-591) provides that it is the policy of the State of Washington to reserve water for future public water supplies. The reservation serves as a policy link between water supply, water rights and long-term growth. The Reservation was last updated in 1988. The City may wish to consider requesting that Thurston County take the lead in working with DOE, to revise the reservation regulation to re-allocate approved withdrawals of groundwater to areas that are likely to produce developable quantities of water. Specifically the NE Wellfield area, and the S.W. Urban Growth Area, where the City faces significant challenges in providing water to serve a growing community, could be targeted for increased withdrawals, while other locations could be targeted for reductions.

COORDINATED WATER SYSTEM PLAN

In the Critical Water Supply Service Area, according to the Regional Coordinated Water System Plan (revised 1996) any new water system after 1985 must meet urban level water system development standards so that, “as the land develops, the residents and businesses in the North Thurston area can be assured of a high quality of water service and fire protection”. (1996 Coordinated Water System Plan, page 17). These standards are for the most part fire and engineering related.

Without water rights, the engineering requirements for pipes and fire hydrants will not be sufficient to serve growth. The City should request that Thurston County reconvene the Public Water Supply Coordination Group to add provisions relating to water rights. These provisions would establish a requirement that applicants for new water system approval in the UGA shall agree to transfer valid vested and inchoate water rights to the City at the time that the City is ready to serve. This requirement would be a development standard for water systems in the Critical Water Supply Service Area.

Approval of new water systems would be contingent on the new water system’s agreement (at the time of development) to transfer water rights when it receives service from the City.

WATER RIGHT TRANSFERS

The City has established a policy asking that existing Group A and Group B water systems requesting water service from the City transfer water rights to the City. In consideration for this transfer at the time of hookup to the City system, the City may provide a reduction in water system connection charges commensurate with the valid right which has been approved for transfer by the Department of Ecology. An example of letter agreement memorializing this arrangement is attached.

WATER CONSERVATION

A part of the evaluation of any system will be an assessment of improvements necessary to achieve acceptable system losses (at or below 10%) in the range of 10% or less.

A record of any conservation-related communications with customers by the system seeking City services, and the results of those communications, either quantitative (demand reduction) or qualitative (behavioral changes of customers), will be provided to the City.

Water conservation elements shall be incorporated into any agreement transferring a water system to the City or any agreement by the City to serve. The City shall incorporate conservation messages and target conservation programs to customers served by the satellite system. The City shall track production and consumption figures for each satellite system, identify conservation results, and tailor future programs to specific needs as feasible.

This provision does not apply where limited contract services are involved, unless the contract services call for the City to provide water conservation program services.

TIME FRAME FOR SERVICE

Systems seeking service from the City of Tumwater will need to provide information and or the City will need to conduct surveys establishing the suitability of the transfer; agreements will need to be drafted and negotiated, and improvements made, prior to service being provided.

Decisions as to when to serve shall be made on a case-by-case basis. Special attention to quick turnaround may be called for where the system is in receivership and both parties agree to a shorter time frame; or where the Washington State Department of Health or Thurston County Health Department request quicker turn-around, and both parties to the agreement agree on a shorter timeframe.

SHORT-TERM OPPORTUNITIES FOR SATELLITE MANAGEMENT OR TIE-IN

Short-term, the City should focus on two types of systems:

1) Systems in the immediate vicinity of the current water service area which provide easy access for operations staff and offer easy integration into water system management routines; and

2) Systems likely to expand to serve adjacent growth. Opportunities may include:

- Deschutes Cove
- Monaco Court
- Lazy Court
- Shalom Drive
- Holiday Court
- Prine Villa
- SunCrest

Some of these systems may not be approved for operation due to system deficiencies, Department of Health funding may be available to assist in addressing these problems; financing options should be discussed with DOH prior to acquisition of systems needing substantial improvements.

Systems such as Pederson Place, which is currently operated by another satellite manager, may seek service from the City due to the economic disincentive that satellite managers from outside the UGA experience in

operating systems from a distance. They do not have the incentive, as the City does, of incorporating systems into a larger water system. The City is in a position to consolidate its service area and distribute programmatic costs, such as water quality, and to some degree, capital costs such as water storage, over a larger rate base. Costs which are solely attributable to satellite service obligations will be borne by ratepayers in those systems.

SIX YEAR PROGRAM

It is recommended that the City approach one or two close-in systems over the next six years to determine whether a viable relationship, beneficial to both parties, may be developed.

DATA MANAGEMENT

In preparation for entering into satellite system agreements, the City should identify suitable cost tracking software and operations/scheduling software, and set up separate tracking systems and schedules for each system.

SMA CONSISTENCY WITH LOCAL PLANS AND POLICIES

TO: DOH Drinking Water

FROM: _____ County

_____ _____

Representative Name Representative Signature

DATE: _____

RE: SMA Plan for _____ and have determined:

_____ Plan is in conformance with established plans and policies.

_____ The plan is inconsistent with established plans and policies and the following deficiencies must be addressed:

_____

_____

_____

_____

_____

_____

Form SMA/C
Department of Health, Drinking Water System

SATELLITE MANAGEMENT NOTICE OF INTENT

Applicant Name (Name of entity/organization):	City of Tumwater
Address of Applicant:	555 Israel Road SW
	Tumwater, WA 98501
Name of Contact Person:	Dan Smith
Title of Contact Person:	Water Resources Program Manager
Phone Number of Contact Person:	360-754-4140
County(ies) for whom the applicant is seeking approval:	Thurston
Submittal Date:	
	Signature

ISSUES TO CONSIDER IN DETERMINING WHAT TYPE OF SMA TO BECOME

	Type of SMA		
Issues	**Ownership**	**Operations**	**Contract Services**
Complete control of the water system	•		
Limited control of the water system		•	•
Must meet requirements of WAC 246-295-050	•		
Must meet requirements of WAC 246-295-060		•	
Does not require SMA approval			•
SMA placed on county referral list	•	•	
Must prepare a water system plan	•		
Possible access to public financing (public entities	•		
Distribution of costs (Economies of Scale)	•	•	•
Possible reduction in DOH annual operating permit fee	•		
Entity may limit the types of services it chooses to provide			•
Contracts may be developed on a case by case basis			•

RECEIVERSHIP (CHAPTER 7.60 RCS AND CHAPTER 43.70 RCW)

During receivership actions, DOH will meet with water system owners and users to discuss restructuring options. Satellite management may be identified as a viable option open to the water system. If voluntary restructuring options do not occur and receivership is pursued, SMAs may be contacted to determine if they are interested in serving as the water system's receiver. Court actions will determine receivership.

FEES (WAC 246-290-990)

Review fees for SMA plans will be broken into three categories:

a. SMA plan for ownership (new and updated)
b. SMA approval amendment
c. SMA plan for operation only (new and updated)

See WAC 246-290-990 for the current fee schedule.

WATER WORKS OPERATOR CERTIFICATION (CHAPTER 246-292 WAC)

Each 'approved' SMA is required to employ a WDM 2 at a minimum. The certification requirement may be higher depending upon certification requirements.

INFORMATION SHOULD BE SUBMITTED TO THE FOLLOWING:

County Potential Lists (WAC 246-295-030)

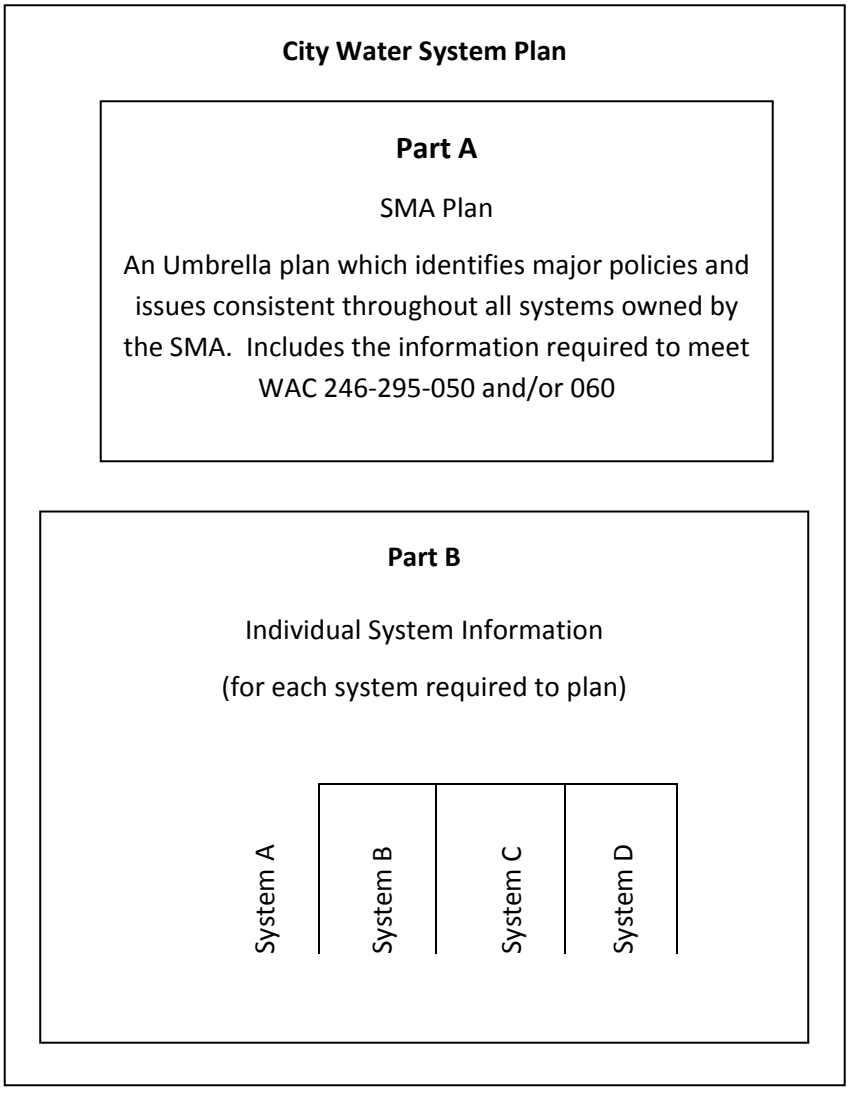
Notice of Intent (WAC 246-295-040)

Department of Health
Drinking Water Program
Planning Section
P.O. Box 47822
Olympia, WA 98504

SMA Plans and Water System Plans (WAC 246-295-040)

Regional Office
Southwest Regional Office
Department of Health
Drinking Water Program
P. O. Box 47823
Olympia, WA 98504-7823

RELATIONSHIP BETWEEN THE WATER SYSTEM PLAN AND THE SMA PLAN

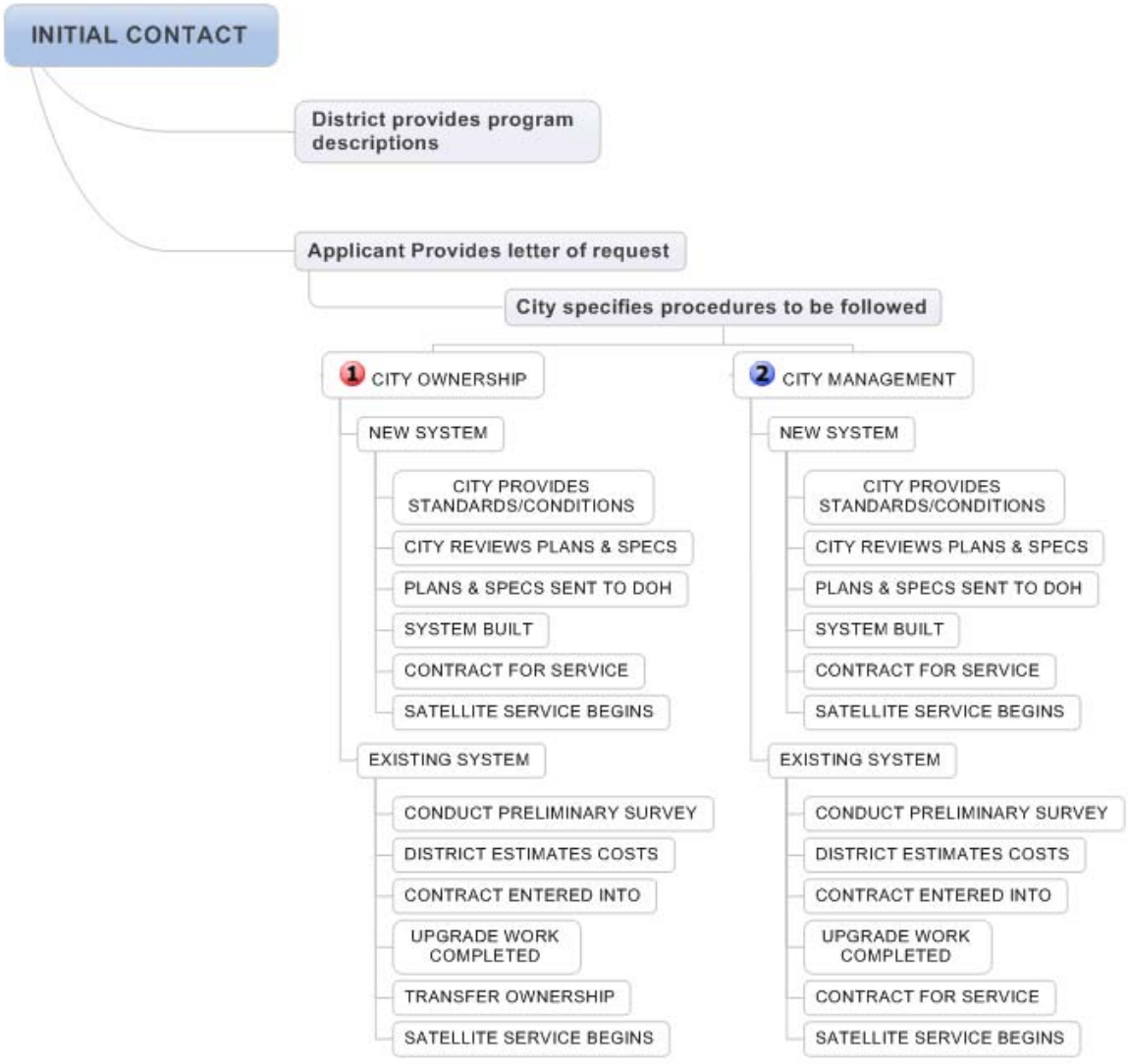


DOH APPROVED SATELLITE MANAGEMENT AGENCIES

SMAs approved by DOH for operation in Thurston County as of June 10, 2009.

Clearwater Utility Services LLC (SMA #146) 219 Little Street SW Tumwater, WA 98512	*Management & Operations only* Contact: Tim Tayne (360) 357-5537
H & R Waterworks, Inc. (SMA #123) PO Box 3 East Olympia, WA 98540	*Ownership, Management & Operations* Contact: Stephen Harrington, President (360) 357-3277
H2O Management Services (SMA #140) 151 E Leisure Lane Grapeview, WA 98546	*Management & Operations only* Contact: Drew Noble (360) 427-0654
Northbay Water Utility Corporation (SMA #113) 1286 NW Maryland Chehalis, WA 98532	*Ownership only* Contact: Jennifer Dickinson (360) 748-3805
Northwest Water Systems (SMA #119) PO Box 123 Port Orchard, WA 98366	*Management and Operations only* Contact: Reg Hearn, President (360) 876-0958
Pacific Water Systems, Inc. (SMA #125) 333 N Prairie Road Chehalis, WA 98532	*Management & Operations only* Contact: Victoria Lantau (360) 262-9580
Thurston County (SMA # 134) 921 Lakeridge Drive SW, Building 4, Room 100 Olympia, WA 98502	*Ownership, Management & Operations* Contact: Richard Blinn, P.E., Director (360) 357-2491
Thurston Public Utility District (SMA #147) 210 Union Street, Suite G Olympia, WA 98501	*Ownership, Management & Operations* Contact: Kim Gubbe (360) 357-8783
Tri-County Water (SMA # 138) 1286 NW Maryland Chehalis, WA 98532	*Management & Operations only* Contact: Jennifer Dickinson (360) 748-3805
Washington Water Service Company (SMA #114) 6800 Meridian Road SE Olympia, WA 98513-6302	*Ownership, Management & Operations* Contact: Paul Robischon (360) 491-3760

FLOW CHART FOR SMA DECISION-MAKING



SMA APPLICATION CHECKLIST

WATER SYSTEM DATA REQUEST

REQUESTED	RECEIVED	SOURCE	
☐	☐	Construction	As-Built Plans
☐	☐		Well Log
☐	☐	Water Quantity	Pump Test Results
☐	☐		Hydrogeologic Reports
☐	☐		Water Rights (Applications, Permits, Certificates, Claims)
☐	☐	Water Quality	Deed or Easement for 100 ft
☐	☐		Sanitary Control Radius
☐	☐		Bacteriological Test Results – including total coliform for last 3 years
☐	☐		Inorganic Chemical Test Results Primary and Secondary, for last 6 years
☐	☐		Organic Chemical Test Results – for last 3 yrs
☐	☐		Volatile Organic Chemical Test Results – for last 3 years
☐	☐		Synthetic Organic Chemical Test Results – for last 3 years
☐	☐		Radiological and Turbidity Test Results – for last 4 years
☐	☐		Type of Treatment – if any

REQUESTED	RECEIVED	PUMPS	
☐	☐	Equipment	Location and Use
☐	☐		Horsepower and Capacity
☐	☐		Pump Curves
☐	☐		Method of Control

☐	☐	Installation	Meters – Flow/Hour
☐	☐		Pump house Facilities
☐	☐		As-Built Plans

REQUESTED	RECEIVED	STORAGE	
☐	☐	Gravity	As-Built Plans
☐	☐		Location and Service Area
☐	☐		Overflow Elevation
☐	☐		Capacity
☐	☐		Type of Construction
☐	☐		Assessable/Secure
☐	☐	Hydropneumatic Equipment	As-Built Plans
☐	☐		ASME Approved Certification
☐	☐		Relief Valve Data
☐	☐		Method of Air Make-Up
☐	☐		Control Equipment

REQUESTED	RECEIVED	DISTRIBUTION SYSTEM	
☐	☐	Construction	As-Built Plans
☐	☐		Lineal Feet of Pipe by Type & Size
☐	☐		No., Type, Size of Fire Hydrants
☐	☐		Depth of Burial
☐	☐		Valves – Placement and Type
☐	☐		No. of Pressure Zones - Elevations
☐	☐		No. of Pressure Reducing Valves
☐	☐		No. of Booster Stations or Individual Service Boosters
☐	☐		Conditions of Franchise

☐	☐	Quality and Reliability	Bacteriological Results – for last 3 years
☐	☐		Number and Type
☐	☐		Cross Connection Control Device Information
☐	☐		List of Customer w/Individual Wells for Irrigation/Standby Use
☐	☐		Number of Blow-offs
☐	☐	Individual Services	Total number of service connections
☐	☐		Metered/Unmetered Service Data
☐	☐		Type & Size of Service Pipe
☐	☐		Type & Location of Service Valves
☐	☐		Parcel Numbers for Each Service Location
☐	☐		Meter Size for Each Service Location
☐	☐		No. Meter Yoke by Size & Type
☐	☐		No. Meter Vault by Size & Type

REQUESTED	RECEIVED	OPERATION & MAINTENANCE	
☐	☐	Records	System Maintenance Records
☐	☐		List of Equipment
☐	☐		Electrical Billing – last 3 years
☐	☐		Treatment/Chemical Expenses – last 3 years
☐	☐	Consumption	System Average Day Usage – last 3 years
☐	☐		System Peak Day Usage – last 3 years
☐	☐		Water Source Meter Readings – last 3 years
☐	☐		Water Production – Monthly & Annually – last 3 years
☐	☐		Water Usage – Monthly & Annually – last 3 years
☐	☐		Percentage of System Leakage

REQUESTED	RECEIVED	ADMINISTRATION	
☐	☐	Financial	Water Rates and Other Charges
☐	☐		Method of Collection
☐	☐		Utility Balance Sheet and Ledger of Accounts
☐	☐		Income Statement – last 3 years
☐	☐		Indebtedness Data for System
☐	☐		List of Service Trucks and Other Equipment
☐	☐		Delinquent Tax Status
☐	☐	Facilities	Deed or Proof of Ownership
☐	☐		Verification of Rights-of-Way/Easements for access to all facilities
☐	☐		Franchise Status/Documentation
☐	☐	Service Responsibilities	Number of Existing Customers – by Type
☐	☐		Number of Customers the System is obligated to Serve – by Type
☐	☐		Type of Service Agreement in Effect
☐	☐		*Condition of Plat
☐	☐		*Individual Requests
☐	☐		*Trade for Easement/Land

SMA APPLICATION ATTACHMENT: PRELIMINARY SURVEY CHECKLIST

CITY OF TUMWATER

WATER SYSTEM PRELIMINARY SURVEY CHECKLIST

SYSTEM NAME: _____

Source: (fill out form for each well)

Well #/Name & Location _____

CONSTRUCTION	**YES**	**NO**	**N/A**
1. Concrete slab around casing			
2. Casing extends 18 inches above floor			
3. Sanitary well seal installed			
4. Water level measuring device			
5. Electrical controls within specifications			
6. Source protected against freezing			
7. Control valves & electrical controls operating properly			
8. Well log available			
9. Surface seal at least 18' deep			
QUANTITY	**YES**	**NO**	**N/A**
1. Pump test conducted			
2. Water rights equal or exceed pumping capacity			
3. Water rights in the owner's name			
4. Mater meter installed and operating properly			
5. Pumping capacity equal to peak day demand (0.55 gpm) x (# services) = peak day demand			

Pump Setting _____ Present Static Level _____

Normal Pumping Level _____ Seasonal Variation _____

SYSTEM NAME: _____

QUALITY	**YES**	**NO**	**N/A**
1. Satisfactory sanitary control area at least 100 ft.			
2. Satisfactory bacteriological test results w/in last 3 yrs			
3. Satisfactory chemical test results within last 3 yrs			
4. Satisfactory turbidity or radionuclide test results within last 3 years			
5.Treatment equipment and procedures adequate			
6. Chlorination equipment (gas) in separate, vented room			
7. Adequate chlorine contact time			

Contaminants requiring treatment: _____

Possible source of contamination: _____

Improvements needed: _____

Comments: _____

SYSTEM NAME: _____

STORAGE Location / No. of Tank & capacity of each

_____

_____

GRAVITY STORAGE	**YES**	**NO**	**N/A**
1. Capacity: _____ gallons (total)			
2. Screened ventilation provided			
3. Tank outlet through bottom			
4. Tank inlet and outlet separate			
5. Overflow pipe provided			
6. Tank drain through bottom			
7. Tank drain separate from inlet and outlet piping			
8. Watertight and lockable patch			
9. Exterior ladder usable and accessible			
10. Interior ladder provided			
11. Visual level gauges present and operating properly			
12. Roof watertight			
13. Any visible leaks			
14. Interior paint adequate			
15. Exterior paint adequate			
16. Liquid level controls operate adequately			
17. Low level alarm provided			
18. Site adequately fenced			
19. Top of ground level reservoir at least 24 inches above normal ground surface			
20. Does drain and overflow discharge in an acceptable location			
21. Valve to isolate reservoir from system			
22. Is altitude valve present and operating properly			

SYSTEM NAME: _____

HYDROPNEUMATIC TANK SYSTEM	**YES**	**NO**	**N/A**
1. Tank Size _____ gallons			
a) a. ASME approved			
b) b. Manhole			
c) c. Water level gauge			
d) d. Pressure relief valve			
e) e. Protective coating adequate			
f) f. Bypass piping provided			
2. Air makeup adequate			

IMPROVEMENTS NEEDED: _____

_____

_____

COMMENTS: _____

_____

_____

_____

_____

_____

_____

SYSTEM NAME: _____

DISTRIBUTION SYSTEM

PUMPS: No. / Location _____

_____

PUMPING EQUIPMENT	**YES**	**NO**	**N/A**
1. Operating properly			
2. Pump properly sized			
3. Pump rating: #1 – HP: _____ FLOW: _____ HEAD: _____ #2 – HP: _____ FLOW: _____ HEAD: _____ #3 – HP: _____ FLOW: _____ HEAD: _____			
4. Pump protection			
a. Handoff automatic switch			
b. Operation light present			
c. Pump operation timer			
d. Pump start/stop controls adequate			
e. Low liquid level shut-off			
f. Master water meter			
Total Volume Reading			
Flow Indicator			
5. Pump mounting adequate			
6. Equipped with auxiliary power			
7. Equipped with emergency power input circuitry			
8. Equipment with phase protection			
9. Any irregular noise or vibration from pump or motor			
10. Satisfactory amperage check for pump motor			
11. Have pump or motor ever been rebuilt? If so, when?			

SYSTEM NAME: _____

PUMP HOUSE	**YES**	**NO**	**N/A**
1. Concrete slab floor			
2. Adequate floor drain			
3. Well vented			
4. Heated			
5. Insulated			
6. Adequate lighting			
7. Free from electrical hazards			
8. Pump house locked			
9. Condition of pump house satisfactory			
10. Any leaks from piping			
11. Sampling ports			

PIPING	**YES**	**NO**	**N/A**
1. Type of Pipe: PVC _____ AC _____ Iron _____			
2. Adequate cover (min. depth _____ ft.)			
3. Is majority of pipe looped			
4. Is all pipe diameter 6" or larger (except service lines) smaller pipe: Pipe Dia. _____ Lineal Feet _____			
5. Adequate fire flows available?			
6. Are fire hydrants installed? Standpipes installed?			
7. Are max distances between fire hydrants met (___ft)			
8. Isolation valves on all fire hydrants?			
9. 30 psi minimum pressure at all services			
10. Number of pressure zones Pressure zone____ Elevation Range _____ to _____			
11. Are pressure reducing stations operating satisfactorily			
12. Are booster stations operating satisfactorily			
13. Are there any individual pressure reducing or booster systems? If so, who maintains them?			

SYSTEM NAME: _____

QUALITY AND RELIABILITY	**YES**	**NO**	**N/A**
1. Satisfactory bacteriological results within last year			
2. Any customers with individual wells			
3. Adequate cross connection control			
4. Blow-off valves at dead-end lines and low points			
5. Adequate number of valves for repairs			
6. Any leaks			

INDIVIDUAL SERVICES	**YES**	**NO**	**N/A**
1. Are all services metered			
2. Do all services have a corporation and curb stop			
3. Is meter installation satisfactory			
4. Are meters compatible with service requirements			
5. Type(s) of service pipe in use			

IMPROVEMENTS NEEDED: _____

_____

_____

COMMENTS: _____

_____

_____

_____

_____

_____

EXHIBIT: SAMPLE CONTRACT FOR TRANSFER OF WATER SYSTEM OWNERSHIP

CITY OF TUMWATER

SAMPLE CONTRACT FOR TRANSFER OF WATER SYSTEM OWNERSHIP

CONTRACT # _____

This is an agreement between the City of Tumwater, hereinafter called the City, and _____ _____

Address: _____

City: _____ State: _____ Zip: _____

Herein called the Applicant. This agreement is for the transfer of ownership of the _____ _____ Water System from the applicant to the City.

Section I: TRANSFER OF OWNERSHIP

The terms of this contract are binding upon the owner(s) and all customers of the _____ _____Water System. Effective as of the date of this contract, the ownership and operation responsibility for the _____Water System is transferred at _____ cost to the City of Tumwater, as provided in Exhibit _____, attached hereto and incorporated by reference herein. All existing and future customers will abide by the General Terms, Conditions and Policies of the City. The following documents appended to this contract and incorporated by reference herein:

1. Property Title
2. Easements/Right of Entry
3. Restrictive Covenants
4. Transfer of Water Rights
5. Bill of Sale
6. [Other]
7. Conditions

Section II: OUTSTANDING LIENS OR LITIGATION

The seller warrants that there are no liens or taxes or other purposes outstanding at the time of this purchase against the property of the said system or lawsuits pending against the said system.

Section III: USER CHARGES

The seller warrants that there have been no promises of any beneficial rates to any customer presently or in the future which may be served by this system.

Section IV: AGREEMENT AND PARTIES

The parties hereto agree that Exhibits _____ to _____, attached shall be incorporated as terms of this agreement and by reference are incorporated herein. The parties agree that all changes or modifications hereto shall be in writing. This Agreement constitutes the sole agreement of the parties, notwithstanding other promises or agreements by or of the parties, express or implied.

CITY OF TUMWATER	**APPLICANT**
Date _____	Date _____
By _____	By _____

EXHIBIT

SAMPLE SATELLITE MANAGEMENT MODEL CONTRACT

(FOR MANAGEMENT AND OPERATIONS)

It is agreed by and between City of Tumwater ("Satellite Management Agency") and _____ _____ ("Water System") as follows:

Parties:

The City of Tumwater, whose address is 555 Israel Road, S.W., Tumwater, WA 98501, will henceforth be referred to as the Satellite Management System (SMA). The SMA is authorized to provide services to the Water System under _____

The _____whose address is _____will henceforth, be referred to as the Satellite Water System. The Satellite Water System is, collectively, the owners and persons provided water service by a water source and distribution system which is independent of and unconnected to another water system.

Effective Date: The effective date of this Contract shall be _____

Legal Description:

The property presently served by the Water System is located within Thurston County, Washington, and is legally described:

☐ as attached (Attachment A)

☐ as follows:

_____

_____

_____

_____

The above property is ☐ inside ☐ outside the SMA's DOH approved service area as identified in the Coordinated Water System Plan and on file at Thurston County, and the City of Tumwater.

SMA Services: The SMA shall provide the following services to the Water System:

General Services:

The SMA shall become acquainted with the Water System including all physical facilities (transmission lines, valves, pumps, storage facilities, source(s), controls, treatment equipment and monitoring equipment, etc.) and operations and maintenance requirements.

Operations/Maintenance

Perform routine scheduled operation and maintenance of the Water System in accordance with accepted public health practices. Daily operations and maintenance includes but is not limited to: taking routine and follow-up water quality compliance samples, taking water quality engineering samples; meter readings; monitoring storage tank levels and pressure tank readings.

Implement schedule of periodic maintenance programs including but not limited to: inspect water system components for malfunctions and perform needed repair; prepare water meters for winter operation and subsequent cleanup in spring; exercise all valves and fire hydrants; inspect and test backflow prevention devices.

Record/report instrument readings and water quality results; determine sites and causes of malfunctions; adjust treatment processes or other water system components; insure that the proper records are maintained; and assist in determining remedial actions in emergencies.

Emergency repairs, within a reasonable time after the Satellite Water System has notified the SMA that repairs are needed.

Administrative

Prepare and file reports and other data (including water sample testing) required by other governmental bodies.

Meet public notification requirements.

Service connections/disconnections.

Ordering materials and parts for the operation and maintenance of the water system.

Planning and Technical Assistance

Develop and implement a cross-connection control program.
Develop and implement a coliform monitoring program.
Design annual maintenance strategies.

Develop and implement equipment improvement programs.
Identify design and implement capital improvement projects.
Respond to informational requests from Satellite Water System customers.
Manage consultant selection and project management for design and/or construction.
Respond to press inquiries relevant to services provided.
Develop and implement water resource education, outreach and technical assistance programs, such as conservation, wellhead protection and water quality reports.
Perform construction management of private contractors.
Keep up and maintain as-builts of the water system as required for new construction or other modifications to the existing Water System.
Prepare the Water System's Water System Plan, when appropriate.
Revise the Water System's WFI and submit to DOH.
Other: _____

SMA Charges: The Water System agrees to pay the following to the SMA:

Service Charges. The SMA will charge for the above services on a time, materials and administrative overhead basis set forth in the SMA's rate schedule (Attachment B). The charges will be:

☐ Billed to the Water System at the following address: _____

☐ Billed directly to the customers of the Water System. All billings will be broken down as identified in Attachment_____, unless otherwise stated in this contract.

Connection Charge: All persons connecting to the SMA's water system are obligated to pay the SMA's Connection Charge (including the meter installation charge). These Connection Charges shall be paid:

☐ $_____ in cash at the time of signing this Contract, for each water service connected to the Water System.

☐ As follows: $ _____in cash at the time of signing this Contract, and hereafter in _____monthly installments of _____.

☐ Persons seeking to connect to the Satellite Water System in the future are obligated to pay the SMA's then standard Connection Charge before connection to the Satellite Water System.

☐ Other: _____

Administrative Fee. The Water System ☐ has paid ☐ will pay within 30 days $_____ to the SMA for the SMA's initial administrative and record keeping setup charges.

Reserve Account. The Water System and persons seeking connection to the Satellite Water System in the future shall pay the following amounts to the SMA to be held in reserve (security deposit) against payment for services provided to the Water System, as follows:

☐ The Water System shall pay $_____ in cash at the time of signing this Contract and _____monthly installments of $_____.

☐ Persons seeking to connect to the Water System in the future are obligated to pay the SMA $_____ per connection, before connection to the Water System will be allowed. New connections will also be required to pay _____ monthly installments of $_____.

The Water System is not entitled to interest on the reserve account, and the money in the account may be co-mingled with other SMA funds. If any of the SMA's charges to the Water System are so charged against the reserve account, then the SMA shall, with the approval of the Water System, increase the monthly charges to all customers to reimburse the reserve account for the amount charged against it. The amount and duration of such increased monthly charges shall be determined through agreement between the SMA and the Water System.

If at any time in the future, the reserve account is not adequate to pay the SMA's charge, the SMA may, in its sole discretion terminate this Contract or suspend SMA services hereunder.

The SMA may, in its sole discretion, increase or reduce the amount required in the reserve account and the monthly amounts billed therefore, based on the SMA's past charges, anticipated future charges, and the increased cost to the SMA to provide services hereunder.

Terms and Conditions. The Contract includes all of the terms and conditions in the SMA's _____and as amended in the future.

Without limiting the foregoing, it is agreed as follows:

The SMA does not own the Water System. They SMA's responsibility is limited to the services set forth above.

The SMA has no responsibility in the event that the Water System water source is interrupted, the volume thereof is reduced, or the water is contaminated.

The Water System hereby grants the SMA an irrevocable license to enter onto the well site and properties in performance of the SMA's responsibilities under this Contract, and to inspect the Water System. [Attach Easement//Right of Entry documents as appropriate]

The water system hereby grants the SMA a right of first refusal or option to purchase the system as follows: _____ [Attach documents]

Water System Repairs and Improvements. This Contract shall not become effective until repairs and improvements to the water system are:

☐ performed by the SMA after the Water System has deposited with the SMA sufficient funds to defray the cost thereof

☐ performed by the owners at their expense

☐ no repairs are required

☐ as follows: _____

☐ as described in Attachment _____

Duration. This Contract shall remain in force until terminated in writing by either party upon 60 days written notice to the other. The terminating party shall forward a copy of the contract termination notification to DOH. All expenses incurred up to the effective date of termination shall remain due and payable following termination of the agreement.

Assignment/Delegation. The rights and responsibilities, under this agreement may not be assigned or delegated without the express written agreement of both parties.

Integration. This Contract constitutes the entire agreement between the parties. There are no other verbal or written agreements or representations which modify or affect this Contract.

Amendments to this Contract shall be in writing and shall be signed by the responsible person from each party.

Indemnification. The Water System shall assume the risk, or be liable for, and pay all damages, loss, cost and expense of any party arising out of the performance of this Contract unless such damage, loss, cost or expense is caused solely by the negligence or willful misconduct of the company and its employees. The original owner shall indemnify and hold harmless from all claims, losses, suits, actions, cots, counsel fees, litigation, litigation costs, expenses, damages, judgments, or decrees by reason of damage to any property, or business and/or death, injury or disability to any person or party arising out of or suffered directly or indirectly by reason of or in connection with the performance of this Contract or any action, error or mission of the Water System, Water System's employees, agents or subcontracts.

Disputes. [Mechanism to be determined]

City of Tumwater / Satellite Management Agency	Water System:
By:	By:
Title:	Title:
Date:	Date:

EXHIBIT: SAMPLE SERVICES CONTRACT

CITY OF TUMWATER

CONTRACT #: _____

This is an agreement between the City of Tumwater hereinafter called the City, and _____Water System, Washington, hereinafter called Applicant. This agreement is for the provision of Contract Services as prescribed in paragraph 1A below, and is effective for two years from date of signing, contingent upon system approval by the Thurston County Health Department.

Section I: SERVICES

Scope of Services – On an annual basis or as required, a water sample will be taken and turned in to the Thurston County Health Department for bacteriological analysis. In addition, other water sampling will be taken as required by the Thurston County or Washington State Health Department for nitrates, inorganic, or synthetic inorganic to ensure the drinking water meets all standards.

On an annual basis, the static and pumping water level of the well will be checked and recorded.

During the year, random checks on the condition of the system may be made as City employees pass through the area.

In the event that City personnel find any problem with the water system during the checking, they will immediately contact the owners or designated representatives, and will not make or authorize any repairs without permission, except in a bona fide emergency. If the City is notified of an emergency (no water), due to a broken water line, well pump, or electrical problem, and the owner or designated representatives are not available to authorize repairs, the City, at its discretion, may make or authorize temporary repairs in order to provide water to the homeowners and will be reimbursed at cost plus 15 percent.

All maintenance and repair of system facilities is the responsibility of the owner, except as follows: Water meters of sufficient capacity will be installed at the well and at all services by the Applicant.

Compensation – All billings will be on an as required basis as described below.

Labor and professional hours will be billed based on the wage and benefit schedules as set forth by the City and in effect during the life of this agreement, and by reference are incorporated herein, plus fifteen (15) percent.

Section II: AGREEMENT AND PARTIES

The parties hereto agree that all changes or modifications hereto shall be in writing. This Agreement is in lieu of all others expressed or implied.

Section III: RECORD OF CHANGE / MODIFICATION

Letter Date	Topic	Signatory Accepted by the City

(Copies of all letters of modification must be signed by the City and attached hereto and a copy returned to the Applicant.)

Section IV: STANDARD CLAUSES

IV(A): Situs: The parties hereto agree that the situs of this agreement and the law governing its interpretation is the State of Washington and the laws of that state.

IV(B): Other Professional, Paraprofessional and Secretarial Fees: The fees for service provided by the City, if any, other than those expressly stated in Section I, as additionally directed by the Applicant shall be based on the wage and benefit schedules as set and revised by the City, and by reference are incorporated herein, plus fifteen (15) percent for handling. All sums billed to Applicant under this clause shall be payable in full, thirty (30) days following receipt of billing.

IV(C): Travel Expense: Travel expenses associated with tasks covered under this contract will be billed on the basis of mileage rates set by the City.

IV(D): Past Due Billings: The applicant agrees that any sums billed, not disputed in written form setting forth specific exceptions and unpaid after thirty (30) days from the billing date, shall bear interest at 7% annual interest rate compounded monthly until collected in full, together with legal fees, court costs and administrative charges as necessary to effect collection.

Section V: LIABILITY

[Insert hold harmless clause]

Section VI: TERMINATION

Either party hereto may cancel this agreement by rendering written notice duly posted to the City or to the Applicant at the address noted hereon. Notice of termination must be received 60 days prior to the desired termination date. The duration of Contract Service will extend for 1 year renewable periods, unless other arrangements are agreed to in writing.

Section VII: EXHIBITS

Attachments Included by Reference in This Contract

CITY OF TUMWATER	APPLICANT
BY:	BY:
DATE:	DATE:

ACCEPTANCE BY THURSTON COUNTY HEALTH DEPARTMENT

BY: DATE:

Design and Construction Standards

CHAPTER 6

Water

6.010 General

Any extension of the Tumwater Water System must be approved by the Department of Public Works and, all extensions must conform to the State Department of Health and the Coordinated Water System Plan and the City Water Comprehensive Plan.

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, as required by the City, whether adequate water pressure and volume will be available to meet fire flow requirements. An analysis of the system shall be required to confirm that fire flow requirements will be met.

All new homes and businesses constructed within the corporate City limits shall connect to City water. All new homes and businesses constructed within the City of Tumwater's Urban Growth Area shall connect to City water provided that the structure originates within 200 feet of a public water main; in the case of private residential or commercial development where the developed property abuts a right-of-way in which a public water main is located or where a service connection is otherwise provided, all structures requiring water shall be required to connect to city water regardless of distance from the public water system.

Anyone who wishes to extend or connect to the City's water system shall contact the Development Services Department for appropriate approvals.

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 and Special Power of Attorney for Annexation if required, and all applicable fees must be paid. For exceptions to this policy see Section 3.120 C.2.

Issuance of building permits for new construction shall not occur until final Public Works approval is given. As an exception to this policy, building permits may be issued upon completion and acceptance of the

required fire protection facilities and the requirements as outlined in 3.120 C.2 have been met. **The certificate of occupancy will not be issued until final Public Works approval is given for all improvements.**

6.020 Design Standards

The design of any water extension/connection shall conform to City Standards and any applicable standards as set forth herein and in Sections 3.010 and 3.060. Mains and fittings shall be located on the north or east side six feet off centerline of the roadway, drive aisle, private drive, or easement. On boulevards and arterial roadways, the location of the water main and fittings shall be located as directed by the City, see Chapter 4 street details.

The layout of extensions shall provide for the future continuation and/or "looping," of the existing system. Specific looping requirements shall be determined during plan review by the City. Dead end mains shall only be installed if looping is impractical due to topography, geology, or as determined by the City. At a minimum, two connection points on separate mains to provide dual feeds for the development shall be required. In addition, main extensions shall be as required in Chapter 3.190.

In order to prevent transient water conditions and increased pressure losses, water main velocities shall not exceed 8 feet per second during peak and fire flow conditions.

The General Notes on the following page shall be included on any plans dealing with water system design.

6.024 Water Modeling

Water modeling shall be required to adequately size and loop mains in order to achieve fire flow and peak hour demands. The City will determine whether the modeling will be completed by the City or by the design engineer.

Peak hour demand modeling will only be completed when required by the City.

Fire flow (flow and pressure) will be determined through modeling under conditions specified by the City. A physical fire flow test will not replace the requirement for modeling.

General Notes (Water Main Installation)

1. All workmanship and material shall be in accordance with City of Tumwater standards and the most current copy of the WSDOT/APWA Standard Specifications for Road, Bridge, and Municipal construction. In cases of conflict, the most stringent standard shall apply.

2. The contractor shall be in compliance with all safety standards and requirements as set forth by OSHA, WISHA, and the Washington State Department of Labor and Industries.

3. The contractor shall be responsible for all traffic control in accordance with the WSDOT/APWA Standard Plans for Road, Bridge, and Municipal Construction (all applicable "K" plans) and/or the Manual on Uniform Traffic Control Devices MUTCD). Prior to disruption of any traffic, a traffic control plan shall be prepared and submitted to the City for approval. No work shall commence until all approved traffic is in place.

4. All approvals and permits required by the City of Tumwater shall be obtained by the contractor prior to the start of construction.

5. If construction is to take place in the County right-of-way, the contractor shall notify the County and obtain all the required approvals and permits.

6. A preconstruction meeting shall be held with the City of Tumwater Construction Inspector prior to the start of construction.

7. The contractor shall be fully responsible for the location and protection of all existing utilities. The contractor shall verify all utility locations prior to construction by calling the Underground Locate line at 1-800-424-5555 a minimum of 48 hours prior to any excavation.

8. It shall be the responsibility of the contractor to have a copy of an approved set of plans on the construction site at all times.

9. All surveying and staking shall be performed per the corresponding chapter of the City of Tumwater Development Guidelines and Public Works Standards.

10. Temporary erosion control/water pollution measures shall be required in accordance with Section 1-07.15 of the WSDOT/APWA Standard Specifications for Road, Bridge, and Municipal Construction and the City

of Tumwater Drainage Design and Erosion control standards. At no time will silts and debris be allowed to drain into an existing or newly installed facility unless special provisions have been designed.

11. Water mains equal to or less than ten inches in diameter shall be AWWA C900 Class 200 or ductile iron standard pressure rating 350. Water mains larger than 10 inches in diameter shall be ductile iron standard pressure class rating 350. See Chapter 6.030B for more detailed pipe specifications.

12. Gate valves shall be resilient wedge, NRS (Non Rising Stem) with O-ring seals. Valve ends shall be mechanical joint or ANSI flanges. Valves shall conform to AWWA C 515 latest revision. Valves shall be Mueller, M & H, Kennedy, Clow R/W or Waterous Series 2500.

13. **Existing valves shall be operated by City employees only.**

14. Hydrants shall be City approved as specified on the hydrant and shall be bagged until the system is approved. All hydrants shall be equipped with Storz adapters.

15. The contractor shall install, chlorinate, and flush all water lines. The lines shall be chlorinated and tested in conformance with the above referenced specification (See Note 1 above) and Section 6.200 of the Development Guidelines and Public Works Standards. After flushing the chlorinated water from the disinfected lines, the contractor shall measure the chlorine residual to verify that flushing is complete. This shall be completed prior to requesting the City for microbiological samples.

16. All pipe and services shall be installed with continuous tracer tape installed 12" to 18" under the ground surface. The marker shall be plastic non-biodegradable, metal core backing marked "water" which can be detected by a standard metal detector. Tape shall be Terra Tape "D" or approved equal. In addition to tracer tape, install direct bury, U.S.E. 14 gauge blue coated copper wire, wrapped around or taped to the pipe, as shown on detail. Low voltage grease-type splice kits shall be used on tracer wire. Continuity testing of the wire will be done by the City.

17. All service line locations shall be marked on the top or face of the curb with an embossed "W" 3 inches high and ¼ inch into concrete.

18. The City will be given 72 hours notice prior to scheduling a shutdown. Where connections require "field verification", connection points shall be

exposed by contractor and fittings verified 72 hours prior to distributing shut-down notices.

19. Separation between water and sewer shall be maintained per Department of Ecology (DOE) standards. See Development Guide Section 6.130 for more information.

20. A concrete pad per detail shall be installed around all valve boxes and blow-offs that are not in a pavement area.

21. At any connection to an existing line where a new valve is not installed, the existing valve must be pressure tested to City standards prior to connection. If an existing valve fails to pass the test, the contractor shall make the necessary provisions to test the new line prior to connection to the existing system or install a new valve.

22. The minimum burial depth of all water lines shall be 42 inches.

23. It shall be the contractor's responsibility to field verify the location and depth of the existing main and provide the fittings required to make the connection to the existing main.

24. At the City's request the contractor shall install a temporary 2-inch brass blow off for flushing and sampling on the existing and/or new water main. The blow off shall be constructed with a standard 2-inch tapping saddle and Ford brass corporation stop with 2-inch brass pipe extended up to finished grade. When flushing and sampling are completed the 2-inch pipe shall be removed. The corporation stop shall be shut off and capped tight with threaded brass cap.

25. When an existing City water main is to be abandoned it shall be the developer's responsibility to coordinate and abandon the existing main. It shall also be the developer's responsibility to install and transfer existing water services to the new main.

26. Sand shall be placed around and under service lines by hand to a height of 6-inches above and 4-inches below the line (s). Excavation for the meter box shall be an additional one foot around the entire box and backfilled with sand per City detail.

27. Meters 3 inches or larger in size must be ordered by the contractor/developer a minimum of 10 weeks in advance of installation.

28. All valve box, blow-off, and manhole lids shall be clean and clear of asphalt or concrete before scheduling a walk through.

29. The water main and appurtenances and service connections to the meter setter shall be tested in sections of convenient lengths under a hydrostatic pressure equal to 150 psi in excess of that under which it will operate. In no case shall the test pressure be less than 225 psi.

30. No lot line water mains are allowed.

6.025 Wellhead Protection Areas

The wellhead protection area designated for each of the City's wells is an irregular boundary determined by topography, water flow patterns (both above and below ground), soil types, flow rates and other criteria. Please contact the Development Services Department or Water Resources in Public Works to determine whether your project is situated within a wellhead protection area. In order to protect the public water supply, all applicable portions of the Aquifer Protection ordinance and the Wellhead Protection ordinance as specified in TMC 16.26 and the following criteria shall apply to any project or portion of a project which is partially or completely located within a wellhead protection area.

♦ Existing private wells within the City of Tumwater shall comply with the Department of Ecology standards.

♦ The drilling of new exempt wells, or the redevelopment of existing exempt wells, shall be prohibited within the City's critical aquifer recharge areas except where the use of such wells is for the purpose of the City of Tumwater's water supply, or resource protection, environmental monitoring or remediation of contamination.

♦ All storm water shall be directed away from the well's 100 foot sanitary setback. Storm water shall not penetrate the same aquifer supplying the well within the well's 1-year time-of-travel zone.

♦ A storm and erosion control plan requiring treatment of storm water is required. Depending on the individual characteristics of the project, and the susceptibility of the particular wellhead to contamination, more stringent treatment requirements than those required in the *Drainage Design and Erosion Control Manual for Tumwater* may be imposed by the City.

♦ If the project is to be platted, it must be noted within the covenants of the plat and in the General Notes of any engineering plans that the project is located within the one, five, or ten year time-of-travel zone wellhead protection area.

♦ All garbage bins and dumpsters, except in single family subdivisions, shall be covered in a manner that prevents rainwater from entering the containers. A sanitary drain shall be provided for compaction-style dumpsters that may generate leachate.

♦ In commercial projects, where hazardous products are stored or used, a spill and containment plan shall be implemented. Depending on the nature of a project, more stringent spill and containment requirements than those required in the *Drainage Design and Erosion Control Manual for Tumwater* may be imposed by the City.

♦ Integrated pest management shall be utilized in choosing landscaping. This is required to minimize the use of pesticides, fertilizers, etc. Contact Thurston County Environmental Health for the most current Integrated Pest Management standards.

♦ Land spreading disposal facilities (as defined by WAC 173-304 and WAC 173-308) are prohibited within the designated one-year time-of-travel zone.

♦ Agricultural operations including stockyards and feedlots involving the raising and keeping of farm animals are prohibited in the one-year time-of-travel. TMC 16.26.040. Examples include, but are not limited to, dairies, stables, horse boarding/training, auction facilities, feedlots, and poultry raising.

♦ Gas stations, petroleum products refinement, reprocessing, and storage (except underground storage of heating oil or agricultural fueling in quantities less than 1,100 gallons for consumptive use on the parcel where stored), and liquid petroleum products pipelines are prohibited within the designated one-year time-of-travel zone. TMC 16.26.040. Examples of other prohibited uses include, but are not limited to, maintenance/fueling facilities for municipal, county, state, school district, transit, airports, railroads, and buses. Gas stations without an attendant are also prohibited.

♦ Automobile wrecking yards are prohibited within the designated one-year time-of-travel zone. TMC16.26.040. Examples of other prohibited uses also include junk, scrap, or salvage yards.

♦ Wood waste landfills (as defined by WAC 173-304-100) shall be prohibited within the designated one-year time-of-travel zone. TMC16.26.040.

♦ Dry cleaners, excluding drop-off only facilities are prohibited within the designated one-year time-of-travel zone. TMC16.26.040.

♦ Landfills (municipal sanitary solid waste and hazardous waste) are prohibited within the designated one-, five-, and ten-year time-of-

travel zones. TMC16.26.040.

♦ Hazardous waste transfer, storage and disposal facilities are prohibited within the designated one-, five-, and ten-year time-of-travel zones. TMC16.26.040.

♦ Wood and wood products preserving are prohibited within the designated one-, five- and ten-year time-of-travel zones. TMC16.26.040.

♦ Chemical manufacturing is prohibited within the designated one-, five and ten-year time-of-travel zones. TMC16.26.040.

♦ For any use, new and expanding, within the designated one-, five- and ten-year time-of- travel zones which uses, stores, handles or disposes of hazardous materials, refer to TMC 16.26 for appropriate specifications.

6.030 Main Line

A. Water mains shall be sized to provide adequate domestic, plus fire, flow at the required residual pressure. Fire flow requirements will be determined by the City of Tumwater Fire Marshall; however, the quantity of water required will in no case be less than 1,000 GPM at 20 psi residual pressure for single family and duplex occupancies and a cumulative 1500 gpm at 20 psi residual for all other occupancies except IBC Group U. Check with the City's Building Official for Group U requirements. Fire hydrants shall be located on water mains 8 inches diameter and larger.

The minimum water main size shall meet minimum fire flow requirements and be equal to or larger than eight inches for looped lines and ten inches for dead end lines as long as fire flow requirements can be met. The minimum water main size for commercial and industrial applications shall be 12-inch. Larger size mains are required in specific areas outlined in the Water Comprehensive Plan. Nothing shall preclude the City from requiring the installation of a larger sized main in areas not addressed in the Water Comprehensive Plan if the City determines a larger size is needed to meet fire protection requirements or for future service. Oversizing agreements may be negotiated with the City.

Pressure

- A minimum of 40 pounds per square inch (psi) at customer meters shall be provided during normal demand conditions and 30psi during peak hour demand, not including a fire or emergency; add 4 psi to the required minimum pressure at the meter for each additional floor above the main floor.

- A maximum distribution system pressure of 130 psi shall be provided during normal demand conditions, not including pressure surges.

- Customers receiving service pressures over 80 psi shall follow the provisions of the Uniform Plumbing Code for pressure reduction with individual PRV's.

Velocity

- Under normal conditions, the velocity of water in a transmission main should be less than 5 feet per second (fps).

- Under emergency conditions, such as fire, the velocity of water in the water mains shall be less than 8 fps.

B. All pipe for water mains shall comply with one of the following types:

Ductile Iron Pipe: Ductile iron pipe may be used on mains up to 10-inches diameter. Ductile iron pipe shall be used on mains over 10-inches in diameter. Ductile iron pipe shall conform to AWWA C 151 standard pressure class rating 350 and have a cement mortar lining conforming to AWWA C 104. All pipes shall be joined using non-restrained joints which shall be rubber gaskets, push on type or mechanical joint, conforming to AWWA C 111.

For pipes with less than 42 inches of cover, ductile iron pipe shall be used. The pressure class shall be no less than 350.

PVC Pipe: All PVC pipe shall conform to the latest revision of the following specifications: 4-inch through 10-inch pipe shall meet AWWA C900 Class 200 standards.

Two Inch Pipe: All two inch pipe shall be blue, class 200 polyethylene plastic pipe manufactured from all virgin material, category 5, grade P34, class C high density polyethylene ID ASTM D2239-SDR7 PE 3408; cell classification 335434C to 355434C from Philips Driscopipe, Eagle Pacific (3408), Superlon Plastics, U.S. Poly or approved equal.

C. All fittings shall be ductile iron compact fittings conforming to AWWA C 153. All shall be cement mortar lined conforming to AWWA C 104. Plain end fittings shall be ductile iron if mechanical joint retainer glands are installed on the plain ends. All fittings shall be connected by flanges or mechanical joints. All retaining follower glands shall be ductile iron.

D. All pipe and services shall be installed with continuous tracer tape installed 12 to 18 inches under the final ground surface. The marker shall be plastic non-biodegradable, metal core or backing which can be detected by a standard metal detector. Tape shall be Terra Tape "D" or approved equal. In addition to tracer tape, install 14 gauge, direct bury, U.S.E. blue coated copper wire, wrapped around or taped to the top of pipe, brought up and tied off at valve body as shown on detail.

E. The minimum cover for all water mains from top of pipe to finish grade shall be 42 inches unless otherwise approved. If the pipe is offset to the edge of the road, the actual roadway cross grade shall be projected out and used to measure cover to top of pipe. This will require more fill over the pipe in a fill section but allows the pipe adequate cover in the event of future roadway cuts or widening. If the pipe is located under a ditch, or on the "downhill" slope of the roadway cross-section, the minimum cover over the pipe shall be 42 inches regardless of projected grades.

F. When minimum cover of the water main is in conflict with other utilities, the engineer shall be required to provide the top and bottom elevations of the pipes in conflict. The adjustment of elevation when the minimum cover cannot be met shall be as directed by the City.

G. When designing a water main through an unimproved area, the engineer shall provide a future design of the area to prevent design/construction of shallow mains. The design shall include elevations of the top of pipe at 25-foot intervals. Only ductile iron pipe will be allowed.

6.040 Connecting To Existing Water Main

If a tap or cut-in is being made by anyone other than the City, the City Inspector shall have the contractor sign the Verification of Disinfected Equipment Form.

The existing or new valve against the new connection or the tapping valve shall be pressure tested prior to any new connection.

After the contractor installs the new main, the contractor shall be responsible for disinfecting and flushing it per specifications in Chapter 6.200 of the *City of Tumwater Development Guidelines and Public Works Standards* and AWWA guidelines.

The developer's engineer shall be responsible for determining the scope of work for connection to existing water mains. See detail. Cut-in tees may be allowed only with the approval of the Director of Public Works.

At the City's request the contractor shall install a temporary 2-inch brass blow off for flushing and sampling on the existing and/or new water main. The blow off shall be constructed with a standard 2-inch tapping saddle and Ford brass corporation stop with 2-inch brass pipe extended up to finished grade. When flushing and sampling are completed the 2-inch pipe shall be removed. The corporation stop shall be shut off and capped with threaded brass cap.

It shall 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.

No tap shall be made to an existing main on a Monday without Public Works approval.

A City representative shall be present throughout the entire connection or tapping procedure.

Verification of Disinfected Equipment

Date:	City Representative:	
Location:		Size:
Project Name:	Project Number:	
Type of Connection Being Made Check One: ☐ Connection/Extension ☐ Tap ☐ Cut-in		
Contractor or Tapping Company Information Name: Address:		
City:	State:	Zip:
Phone Number: ( )		
Contractor or Tapping Company Representative:		

Only tapping machines equipped with a "flow-through" release bib shall be allowed.

The contractor listed above hereby certifies that the equipment being used to tap or cut into the City of Tumwater's public water supply has been properly disinfected. The contractor listed above also certifies that this equipment, including blades, has only and solely been used on a potable water supply.

Print Name: _____

Signed: _____ Date: _____

6.050 Service Interruption

The contractor shall give the City a minimum of 72 hours notice of any planned connection to an existing pipeline; this includes all cut-ins, live taps, and extensions. Notice is required so any disruptions to existing services can be scheduled. Either the contractor will notify customers involved or affected by the water service interruption or the City will charge the contractor for the cost of said notification. The contractor shall make every effort to schedule water main construction with a minimum interruption of water service. In certain situations, the City may dictate scheduling of water main shutdowns so as not to impose unnecessary shutdowns during specific periods to existing customers.

6.060 Hydrants

A. Existing hydrants within the construction project shall be upgraded to current standards or replaced as determined by the City.

B. The lead from the service main to the fire hydrant shall be per detail.

C. Fire Hydrants shall have two 2-1/2 inch outlets and one 4-1/2 inch pumper port outlet with a 5 inch Storz adapter. All outport threads shall be National Standard thread. The hydrant shall have a positive and automatic barrel drain. Hydrant shall be of the "safety" or break-away style.

D. Hydrant leads shall not exceed 60 feet. If a hydrant is required 60 feet or more from the main, the main shall be extended, a tee shall be installed and the hydrant lead shall commence from the second tee. The lead from the service main to the fire hydrant up to 19 feet shall be megalugged. For installations exceeding 19 feet, either megaluggs or field lock shall be required. Hydrant extensions shall use restrained joints from the main to the hydrant.

   Approved hydrants are as shown on hydrant detail. All hydrants shall be bagged by the contractor until system is approved.

E. The Department of Public Works and the City of Tumwater Fire Marshall work together to insure that adequate hydrant spacing and installation are achieved.

Unless otherwise required by the City of Tumwater, the following guidelines shall apply for hydrant number and location:

1. On arterials or boulevards, hydrants may be required on both sides of the roadway as determined by the Director of Public Works.

2. At least one hydrant shall be installed at all intersections.

3. Hydrant spacing of 330 feet shall be required in all areas except single family and duplex residential areas.

4. Hydrant spacing of 660 feet shall be required for single family and duplex residential areas.

5. A hydrant shall be located at the end of all mains eight inches or larger if the end of the line is more than 200 feet from the previous hydrant.

6. Hydrants located in cul-de-sac or dead end areas which, either by design, topographic or manmade feature, prohibit straight line distance measurement, shall be located to serve no more than 120,000 square feet or have a maximum travel distance of 330 feet. Where a cul-de-sac or dead end exceeds 330 feet, a hydrant shall be required.

7. When any portion of a proposed commercial building is in excess of 400 feet from a fire hydrant on public street, on-site hydrants may be required by the City of Tumwater Fire Marshall. Such hydrants shall be located per City of Tumwater Fire Marshall and easements for such hydrants shall be granted to the City.

8. An additional fire hydrant may be required at a commercial, institutional, industrial, or converted business if an existing structure is enlarged, altered, repaired, or moved when the floor area exceeds 500 square feet and/or when structural additions, alterations and/or repairs to any portion of an

existing structure within any 12 month period exceeds 25 percent of the value of the structure over 500 square feet.

9. Buildings or structures having a water flow requirement of 1,500 gpm or more shall be supplied by looped 12 inch or larger water mains around the building with hydrants spaced per the Fire Code. Internal looping will be confirmed using water modeling.

10. Hydrants shall be a minimum 40 feet from any building.

11. A two-way, blue reflective hydrant marker per the striping detail shall be required perpendicular to each hydrant. Hydrant markers shall be placed four inches from the centerline on the same side of the road as the hydrant.

A scaled down plan view of the proposed water system shall be included on the plans. The scale shall be appropriate to show the entire proposed system. This plan view shall show the location of all the proposed hydrants plus the location of the appropriate existing hydrants adjoining the project. If the project only includes the addition of one or two new hydrants, the locations of at least 3 existing hydrants in the project vicinity need to be shown on the plan view.

F. Fire hydrants shall be set as shown on the hydrant detail.

G. For requirements regarding use, size and location of a fire department connection (FDC) and/or post indicator valve contact the City of Tumwater Fire Marshall. Location of FDC shall be shown on water plans.

H. Where needed, the Department of Public Works or City of Tumwater Fire Marshall may require hydrants to be protected by two or more bollards. See detail and Fire Code.

I. Fire hydrants meeting required fire flow must be installed, tested, and accepted prior to the issuance of a building permit.

J. All fire hydrants in the City of Tumwater shall be powder coated according to the following procedures:

1. Sandblast hydrant.
2. Preheat hydrant @ 400 degrees for 1 hour.
3. Apply one coat of epoxy base primer, 2.5 to 3.5 mils.
4. Flash 1st coat 15 to 20 minutes @ 400 degrees.
5. Add 2nd coat of powder, 1.5 to 2.5 mils.
6. Bake in oven @ 400 degrees for 40 minutes.
7. Remove and cool.

Powder to be used: Cardinal T009-YL14, D.O.T. Yellow, T.G.I.C. Polyester 90% Gloss.

6.062 Hydrant Meters

Hydrant meters may be obtained by completing the required paperwork with Public Works at the Maintenance Service Center (7200 New Market Street SW). A deposit is required. Once the deposit is made, the meter may be picked up by the applicant. A daily fee and charges for the amount of water used is billed on a monthly basis. Also, any damages incurred and final billings are assessed upon returning the meter to the Maintenance Service Center. Those fees are subtracted from the deposit paid and a refund check is mailed to the applicant.

The contractor shall ensure that measures to prevent backflow, cross connections and contamination of the City system comply with AWWA standards. When using the hydrant meter to fill a vehicle, the vehicle must be equipped with an approved antisiphon air gap. The air gap shall be at least twice the diameter of the inlet pipe. See Detail.

6.065 Fire Sprinkler Underground Line

This chapter refers to building fire sprinkler lines, not irrigation or landscape sprinkler lines.

City of Tumwater Fire Marshall will witness the test of the sprinkler underground line and obtain the certificate for underground piping. The sprinkler underground line shall be tested per N.F.P.A. pamphlet #24 standards. The sprinkler underground line shall not be tested until Public Works has tested and approved the distribution main up to the City valve. A microbiological sample shall be obtained from the fire sprinkler main between the City's main line valve and the backflow prevention assembly (BPA). The City's main line valve shall not be opened before a satisfactory test result has been returned. See drawing

6-25 for a map clarifying the location of the City valve and the sprinkler underground line.

If a BPA is not located in a public right-of-way, easements shall be required. The sprinkler underground line shall be that portion of the line located behind the City valve.
In no instance shall domestic or irrigation service connections be made to the sprinkler underground line.

See Chapter 6.110, Backflow Prevention, for additional information.

6.070 Valves

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

Valves shall be installed in the distribution system at sufficient intervals to facilitate system repair and maintenance, but in no case shall there be less than one valve every 1,000 feet. There shall be three valves on each tee and four valves on each cross (excluding hydrant tees.) Valves installed with tees and crosses shall be flanged together. All valves shall open counter-clockwise. Additional valves and valve spacing may be required by the City during plan review.

A. Gate Valves, 2 inch to twelve inch: The design, materials and workmanship of all gate valves shall be Ductile Iron Body resilient wedge valves conforming to AWWA C515 latest revision. Gate valves shall be resilient wedge non-rising stem (NRS) with two internal O-ring stem seals. Gate valves shall be Mueller, M & H, Kennedy, Clow R/W, Waterous Series 2500, or American AVK.

B. Butterfly Valves: Butterfly valves shall be used on all lines 14 inches and larger except when a tapping valve is required. Butterfly valves shall conform to AWWA C504, Class 150B, with cast iron short body, O-ring stem seals,geared operator designed for underground installation, and a 2-inch square operating nut. Butterfly valves shall be Mueller, Linseal III, Kennedy, M&H, Pratt Ground hog, or Allis Chalmers.

C. Valve Box: All valves shall have a standard East Jordan Iron Works or an Olympic Foundry VB-950 water valve box, set to grade with a 6-inch ASTM 3034 SDR 35 PVC riser from valve to within 4 to 6 inches of valve box top. If valves are not set in

paved area, a concrete pad shall be set around each valve box at finished grade. In areas where valve box falls in road shoulder, the ditch and shoulder shall be graded before placing asphalt or concrete pad. See detail.

D. Valve Marker Post: Valve marker posts shall be 4-inch by 4-inch reinforced concrete or schedule 40 steel posts 5-feet long stamped with "W" and distance to valve in blue. Post shall be painted with one base coat and two coats white oil base enamel. The need for valve marker posts will be determined during plan review. See detail.

6.075 Bend Markers

Bend markers are required when water lines are located outside the right-of-way. When the direction of a main changes due to a bend, then a bend marker shall be required. See bend marker details.

6.080 Casing

The casing shall be as follows: one quarter inch steel casing pipe or ductile iron class 52. In special cases C-900 class 200 PVC pipe may be allowed. Casing spacers are required. A minimum of three spacers are required per 20-feet of pipe. Spacers shall be as manufactured by Uni-Flange®, Calpico Inc. or approved equal. No more than one inch of clearance is allowed per set of spacers or insulators.

All pipe within casings shall be ductile iron class 52.

The joints of the transmission pipe within the casing pipe shall be restrained with a Restrained Casing Spacer made by Uni-Flange®, or if using Calpico Inc. insulators, the pipe joints shall be restrained with a restraint system approved by the City of Tumwater. Restrained joints shall be required on the transmission line one pipe length past either end of the casing pipe. Additional restraints may be required by the City.

6.090 Air and Vacuum Release Valve

Air and vacuum release valves (ARV) shall be installed on the same side of the street (water north & east) as the main, behind the sidewalk on the property corner (residential applications). For mains up to 12 inches diameter ARV's shall be as shown on detail. The engineer shall size the ARV for mains 14 inches diameter and larger.

ARV's must be installed so as not to create a cross connection situation. Measures to prevent backflow, cross connections, and contamination of the City system shall comply with AWWA standards.

The installation shall be set at the high point of the line when required. ARV's shall not be installed in areas subject to high ground water or flooding. Where possible, pipes are to be graded to prevent the need for an air release valve.

6.100 Blowoff Assembly

The blowoff assembly shall be as shown on the details at the end of this Chapter. The pressure rating for blowoff assemblies shall be 200 psi. If located in cul-de-sacs, the blowoff assembly shall be placed near the center of the cul-de-sac. See Section 6.060 for hydrant requirements at the end of 8-inch and larger mains.

6.110 Backflow Prevention

A. General

The installation of required backflow assemblies is necessary to protect the public water system from possible contamination. All water system connections to serve newly constructed and existing buildings or properties with domestic potable water, sprinkler systems, or irrigation systems shall comply with the minimum backflow prevention requirements as established by the Department of Health (DOH), and the American Water Works Association (AWWA) Standards.

Real or potential cross connections with the City of Tumwater water system shall be prohibited under all circumstances.

Please refer to Chapter 6.065 for additional information regarding sprinkler underground lines.

Please refer to Chapter 6.062 for requirements when filling vehicles with a hydrant meter.

B. Definitions Related to Cross Connection Control

Backflow
The undesirable reversal of flow of water or other substances through a cross connection into the public water system or consumer's potable water system.

Backflow Assembly Tester (BAT)
A person holding a valid BAT certificate issued in accordance with chapter 246-292 WAC.

Cross Connection
Any actual or potential physical connection between a public water system or the consumer's water system and any source of nonpotable liquid, solid or gas that could contaminate the potable supply by backflow.

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 shut-off valves attached to each end of the assembly and fitted with properly located test cocks. This assembly will only be used to protect against a non-health hazard.

Double Check Detector Assembly (DCDA)
The term "double check detector 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 is designed for use on fire protection services rated as a low-health hazard, (no chemical addition).

High health hazard
A cross connection which could impair the quality of potable water and create an actual public health hazard through chemical or radiological poisoning, the spread of disease, or physical hazard.

In-Premises or Fixture Isolation
A method of protection for the health of consumers served by the consumer's potable water system. The installation of an approved air

gap or backflow prevention assembly within the property lines of the consumer's premises at, or near, the point of hazard.

Low health hazard
A cross connection that could cause an impairment of the quality of potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of such potable waters for domestic use.

Premises Isolation
A method of protecting a public water system by installation of approved air gaps or approved backflow prevention assemblies at or near the service connection or an alternative location acceptable to the purveyor; to isolate the consumer's entire water system from the public water system.

Reduced Pressure Backflow Assembly (RPBA)
The term "reduced pressure backflow 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 shut off valves at each end of the assembly. This assembly is designed to protect against a high health hazard.

Reduced Pressure Detector Assembly (RPDA)
The term "reduced pressure detector assembly" will mean a specially designed assembly composed of a line-size approved reduced pressure principle backflow prevention assembly with a specific bypass water meter and a meter size approved reduced pressure principle backflow prevention assembly. This assembly is designed for use on all fire protection services rated as a high health hazard (with chemical addition).

Unapproved Auxiliary Water Supply
A water supply (other than the purveyor's water supply) on or available to the consumer's premises that is either not approved for human consumption by the health agency having jurisdiction, or is not otherwise acceptable to the purveyor.

Uniform Plumbing Code
The code adopted under RCW 19.27.031(4) and amended under chapter 51-46 WAC. This code establishes statewide minimum

plumbing standards applicable within the property lines of the consumer's premises.

C. Design and Installation Requirements

1. Any backflow prevention assembly must be installed in full compliance with all relevant aspects of the uniform plumbing code (UPC).

2. When a backflow prevention assembly is required, plans shall be submitted to the City of Tumwater for review and approval prior to installation. In the City of Tumwater, premise isolation is required in all development except residential. Residential development will be considered on a case-by-case basis according to the assessed degree of hazard that exists.

3. Premise isolation assemblies must be installed at the point of delivery of the water supply, before any branch in the line, downstream of any pressure reducing valve on private property, in a location approved by the Public Works Cross Connection Control Specialist or the Public Works Director. Premise isolation assemblies are not permitted inside of buildings.

4. Backflow prevention assemblies and air release valves shall never be submerged in water or installed in any area subject to flooding. If installed in an underground vault, adequate drainage shall be provided.

5. Assemblies must be protected from freezing and other severe weather conditions.

6. If assemblies are to be vertically oriented, the type and model specified shall be approved by DOH for vertical installation in that orientation.

7. All assemblies require a minimum clearance for routine maintenance and testing. Assemblies 2 inches and smaller shall have at least 6 inches clearance on all sides of the assembly. All assemblies larger than 2 inches shall have a minimum clearance of

12 inches on the back side, 24 inches on the test cock side, and 12 inches below the assembly. All RPBA's shall have at least 12 inches of clearance below the drain opening.

8. Support and stability of all assemblies shall be given prime consideration. All assemblies shall be suitably braced to prevent movement.

9. 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.

10. The piping on the inlet side of the assembly shall be rigid brass or copper. Galvanized piping shall not be allowed.

11. When trap primers are required in buildings, a proper air gap (a minimum of two times the supply pipe diameter) is required between the potable water supply and the sewer connection.

12. Backflow assemblies for fire protection shall have approved integrated shut-off valves as part of the assembly and shall be separate from any post indicator valve installed on the sprinkler underground line.

13. When a RPBA is located inside a building or structure, it shall be installed in a location where the occasional spitting from the relief valve and the constant possible discharge in the event of a fouled check valve will not be objectionable. An approved air gap funnel assembly, provided by the manufacturer or fabricated for the specific installation, may be installed to handle the occasional spitting of the relief valve due to pressure fluctuations. A line from the funnel assembly may be run to an adequately sized floor drain of equal or greater size. Check with the manufacturer for the relief valve discharge rates to determine size of the drain.

14. Drains shall be sized to carry the full rated flow of the assembly and shall be double screened and double banded on both ends.

15. Any backflow assembly installed more than 4 feet above floor or ground level shall have a platform under it. The platform shall comply with all applicable safety standards and codes.

16. Assemblies may not be installed above electrical panels or motors.

17. The access to a device located inside a building or structure shall a have minimum accessible entrance of three feet wide by five feet high. There shall be no obstacles or structures interfering with these dimensions that could prevent access to the assembly.

18. When installation is complete, the City of Tumwater Public Works Cross Connection Control Specialist shall be notified, and a Washington state certified Backflow Tester (BAT) shall inspect and test the assembly to insure proper installation and operation. Certificate of Occupancy, and water service, shall not be issued until the Public Works Department is provided with a successfully completed test report.

19. The City of Tumwater Public Works Cross Connection Control Specialist reserves the right to reject the test reports that are not complete and accurate. Submittal of inaccurate test results shall result in denial of report forms and a requirement to retest the backflow assembly.

20. No field modifications shall be made to an approved backflow assembly that will change its configuration or function.

21. An approved certificate for verification of accuracy from an approved calibration laboratory or agency shall be provided to the City of Tumwater Public Works Department on an annual basis for approved backflow testing equipment used in the protection of the City of Tumwater water system. All testing equipment shall be in good working order and be either hydraulic or electronic in nature. All electronic testing equipment capable of producing printed test strips at the time of testing an assembly shall be sent to the City of Tumwater Public Works Department along with a completed assembly test report.

22. Failure to follow any of the preceding requirements regarding backflow assembly testing may result in the test report being rejected and the assembly being retested in the presence of the City of Tumwater Public Works Cross Connection Control Specialist.

When installation is complete, a Washington State Certified Backflow Assembly Tester (BAT) shall inspect and test the assembly to insure proper installation and operation. Certificate of Occupancy and water service shall not be issued until the testing certificate is received, reviewed, and approved by the City of Tumwater.

D. Applicability

Backflow prevention assemblies shall be installed at the expense of the property owner. A backflow prevention assembly shall be installed at any premise or fixture where installation is deemed necessary to accomplish the purpose of these regulations, either at the service connection or within the premises, as determined by the City's Cross Connection Control Specialist or the Director of Public Works. Situations where a backflow assembly will be required include, but are not limited to:

1. If the nature and extent of any activity on a premises, the materials used in connection with any activity on a premises, or the materials stored on the premises, could in any way contaminate or pollute the potable water supply.

2. When existing internal cross connections are not correctable, or intricate plumbing arrangements make it impractical to ascertain whether or not a cross connection exists.

3. If entry is restricted such that inspections for cross connections cannot be made with sufficient frequency or with sufficient notice.

4. If materials of toxic, objectionable, or hazardous nature, either liquids, solids, or gases are being used such that, if back siphonage or back pressure should occur, a health hazard could result.

5. On any mobile apparatus that connects to or takes water from the City's water system.

6. Any use of radiant heat will require the installation of a reduced pressure backflow assembly (RPBA) at the meter.

7. When an in-ground irrigation system is connected to the public water system.

8. Whenever any unapproved alternative water source is present on the premise.

9. A reduced pressure backflow assembly (RPBA) 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 RPBA device shall be installed at the meter.

10. On any premises where a bypass arrangement is installed around the backflow assembly, a second backflow assembly of equal protection shall be installed on the bypass piping.

11. Any customer with a recognized real or potential cross connection shall be required to install an appropriate backflow prevention assembly, commensurate with the degree of hazard and the backflow conditions. Failure on the part of any customer to properly protect the public water system from contamination is sufficient cause for the immediate discontinuance of public water service to the premise. At its discretion the city may elect to install the appropriate backflow prevention assembly at the owner's expense.

E. Follow-up Testing

All backflow assemblies shall be tested on an annual basis, to insure proper operation. Annual testing is required at the user's expense. The results of the annual testing shall be submitted to the City of Tumwater Public Works Department.

A list of certified backflow assembly testers (BAT'S) who have registered with the City and are in good standing, is available upon request. The tester shall hold a current Washington State Department of Health Backflow Assembly Tester (BAT) Certification and possess documentation insuring their test gauge is properly calibrated.

Any BAT who knowingly submits false documents or a false test report shall be removed from the City's list of BAT's in good standing. If the City determines the false report was malicious and/or could have resulted in illness or death, a report will be made to the Washington Department of Health and proceedings to suspend or revoke the BAT's certificate shall be initiated.

All assemblies found not functioning properly shall be promptly repaired or replaced by the water user. If any such assembly is not promptly repaired or replaced, the City may deny or discontinue water to the premise until the correction is made. All testing and repairs are the financial responsibility of the water user.

Existing backflow assemblies that are no longer on the DOH approved list of 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 an approved assembly commensurate with the degree of hazard.

The City of Tumwater has the authority to perform regular inspections on all backflow assemblies used to protect the City's water system and shall be provided reasonable access to the premises for inspection purposes. If reasonable access cannot be provided, a reduced pressure backflow assembly must be installed at the service connection to that premises.

F. Backflow Assembly Test (BAT) Form Requirements

The following information is required on all test report forms submitted to the City. Items 1 through 12 are standard information required on all forms.

1. BAT Certification Number.
2. Name: Name of business or property owner.
3. Address: Your building or residence street address.
4. Device Location: Please give the physical location of the device, such as next to meter, west wall of room 102, 15 feet SW of building, etc.
5. What the Cross-Connection Hazard is: Backflow devices isolate such things as irrigation systems, carbonation machines, boilers, etc.

6. Size/Type: Size and type of backflow preventer, such as ½ inch DCVA.
    - Manufacturer.
    - Name, Serial Number: Be accurate. Include alpha prefixes, such as A120220.
    - Model Number/Model: Use complete model number, such as 007LTK.
7. Proper Installation Annotation: Forms must note if the assemblies were installed in accordance with the installation requirements. If the assembly does not meet these requirements, the discrepancy must be recorded in the remarks section.
8. Remarks Section: Record any comments or discrepancies in this section. For example, if an assembly does not meet the proper installation requirements, note the reason in this section.
9. Test Results: To include the following:
    - Values required for each check valve tested.
    - Repair information and details.
    - Final test results.
10. Test Equipment Information: Record the gauge, make, model, serial number, and verification of accuracy date.
11. Certified Tester Information.
    - Important Note: The report form must include the signature of the person performing the test, a certification number, and the date of the test.
    - All test reports must include legibly printed tester's name, telephone number, certification number, test completion date, gauge serial number, and gauge accuracy.
12. Person Repairing Assembly: Printed or typed name of person repairing assembly.

6.120 Service Connection

A. All service connections relating to new development shall be installed by the developer at the time of mainline construction. Services shall not be connected to a hydrant lead or the sprinkler underground line. After final Public Works approval has been given, 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 system is inspected and approved. The use of construction bibs or "cheaters" is prohibited.

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 service line, the meter, box, and setter.

Service taps larger than 2 inches, connecting to an existing main, shall be made by the contractor per Section 6.040. Service taps that require crossing an arterial street in excess of two lane widths shall be made by the contractor. These types of services shall be denoted on the plans.

C. Service lines shall be as specified herein. No glued joints will be accepted. Service lines shall be installed perpendicular to and 22½° above horizontal of the main. Tracer tape and wire wrapped around the pipe shall be installed on all service lines.

One to two inch diameter service lines shall be blue in color pressure class 200, polyethylene plastic tubing manufactured from all virgin material category 5, grade P34, class C high density weight polyethylene OD ASTM D2737-SDR7 PE3408 or ASTM D2239-SDR7 PE3408; cell classification 335434C to 355434C, from Philips Driscopipe, Eagle Pacific (3408), Superlon Plastics, U.S. Poly or approved equal.

Service saddles with stainless steel straps shall be as shown on the details or approved equal. All clamps shall have rubber gasket and iron pipe threaded outlets.

Corporation stops shall be as shown on the appropriate detail or approved equal with iron pipe threads conforming to AWWA C 800. Stainless steel inserts shall be used with pack joints and polyethylene pipe.

D. With the exception of public and private school sites, new installation of master meters will not be allowed.

E. After January 1, 2007, when connection to the public water system is desired by a customer connected to a well exempt from the

provisions of RCW 90.44.050, the "exempt" well must be properly decommissioned per DOE standards prior to making the connection. When connection to the public water system is desired by a customer connected to an existing well permitted under the provisions of RCW 90.44.050, or with such a "permitted" well on site, a physical disconnect between the well and the public water system must be made and maintained. This is necessary to assure that an unapproved auxiliary water supply (the customer's well) will not contaminate the City's water supply. Provided it is in compliance with DOE setback standards, the customer's "permitted" well may be kept serviceable for irrigation purposes only. In addition, if a well is to be used for irrigation, an RPBA shall be required and installed as premise isolation at the public water supply service connection. If an existing well is not to be used for irrigation purposes, it must be decommissioned per DOE standards. No water meter will be installed until the RPBA is installed and a cross connection inspection has been completed to the satisfaction of the City.

F. Lots or pads created by plats, replats, short plats, or binding site plans shall have a water service installed as required below.

In single family subdivisions, (including mobile home and manufactured home subdivisions) a service shall be provided to each lot or pad, including open tracts and landscaping in the right-of-way. If a domestic and an irrigation meter are desired at a particular lot or tract, additional services shall be installed.

Duplexes shall have a separate service installed for each living unit regardless of how many duplexes are on a single lot. Example: One duplex on one lot shall have two services; two duplexes on one lot shall have four services and so on. A subdivision of duplexes shall have at least one service installed at all open tracts.

Multi-family and commercial complexes shall have at least one meter installed per separate building and a separate irrigation meter(s) if an irrigation system is installed. Additional meters to a multi-family or commercial building may be installed if desired. At least one service shall be installed at all open tracts. Master meters shall meet the criteria as outlined in 6.120D above.

G. Sample stations may be required per the City detail. The requirement for the location and type of sample station will be determined by the City during the plan review. Sample stations shall be located behind the walk on a property line, in an open space, or in a utility easement whenever possible and shall generally be centrally located in the project at a low point if possible.

H. Service configuration shall be as shown on details at the end of this Chapter. Meters 3 inches and larger shall not be placed in a traffic bearing location. For services larger than 3 inches, the engineer shall submit a detail for approval that addresses the following:

- meter type (turbine, compound, etc.) and size,
- a valve shall be located on both sides of the meter,
- a lockable bypass is required,
- check valves shall be required on the bypass and the meter,
- supports (jack stands) are required under the meter and bypass,
- the vault specified shall provide an 18" clear space from the vault wall to the closest edge of the meter, valves, or pipe,
- the vault shall have a double lid with a reader lid insert,
- the distance from the top of the meter to the bottom of the lid shall be 24 inches minimum and 30 inches maximum,
- a ladder shall be provided in the vault,
- drainage must be provided for the meter pit,
- the inside depth of the vault shall not exceed four feet from the top finish grade to the inside floor elevation.

6.121 Water Meter Purchasing

In an effort to eliminate unaccounted water, the use of construction bibs or other devices used to obtain water without a water meter shall not be permitted. Water meters shall be purchased and installed prior to building permit issuance.

The following requirements shall apply to projects located within the Tumwater water service area.

Residential and Commercial Projects within the City limits:

1. The installation of a water meter prior to issuing the residential building permit is required. The applicant will pay for the water meter (s) (not the related water and sewer general facility charges, LOTT

Capitol Development charge and the stormwater charge) prior to the building permit issuance.

2. The Building Official will ensure a meter is in place at the time of the first inspection. Public Works Inspectors, Meter Readers and the Operations staff will report any construction bibs or connections other than City of Tumwater meters as they transit construction projects. Utility Billing staff will monitor AMR (automated meters) to detect abuse/damage through the use of error reports.

3. Prior to scheduling the final building inspection, the sewer, water, and storm connection fees will be paid by the builder/applicant. Final inspection will not be scheduled until all required fees have been paid.

Residential and Commercial Projects within the Urban Growth Area:

1. The builder/applicant will be required to purchase a meter and pay **all** connection fees prior to the issuance of a building permit.

Irrigation Meters:

1. The developer is required to purchase and install irrigation meters prior to the final plat document being recorded or Final Public Works construction approval being provided.

2. Operations staff will be responsible to verify that irrigation meters are installed at the time of the walk through inspection.

General Water Meter Requirements:

1. For all projects that receive City of Tumwater water, builders/developers will be billed for the cost of replacement or repair of all damaged meters.

2. When devices other than City of Tumwater water meters are found in violation of City policy, violators shall be charged with a misdemeanor.

3. Any project that has received a building permit prior to the 2010 Development Guidelines approval are vested and allowed to utilize construction water (for 90 days) as previously permitted; however all are encouraged to purchase their meters at the earliest date possible.

6.125 Marking Service Lines

The location of all service lines shall be marked on the face or top of the cement concrete curb with a "W" 3 inches in height and 1/4 inch into the concrete.

6.130 Water Main/Sanitary Sewer and Reclaimed Water Crossings

The Contractor shall maintain a minimum of 18 inches of vertical separation between sanitary sewers and reclaimed water, and water mains. To accommodate crossings, the minimum cover for water main of 42 inches may be reduced to 24 inches upon approval by the City to provide for as much vertical separation as possible. When a reduced depth is allowed, ductile iron pipe and/or casings may be required. See 6.080 for casing specifications.

Pressure sewers and reclaimed water shall only be installed under water lines. The vertical separation of 18 inches shall be at a minimum of 10 feet on either side of the crossing. The longest standard length of water pipe shall be installed so that the joints will fall equidistant from any sewer crossing. In some cases where minimum separation cannot be maintained, it may be necessary to encase the water pipe and/or sewer/reclaimed water service in pipe per DOE standards. No concrete shall be installed unless specifically directed by the City.

6.140 Water Main/Sanitary Sewer and Reclaimed Water in Parallel

Refer to the City of Tumwater details for water main/sanitary sewer and reclaimed water in parallel.

6.150 Staking

All surveying and staking shall be performed by an engineering or surveying firm capable of performing such work. The surveyor directing such work shall be licensed as a Professional Land Surveyor by the State of Washington.

A preconstruction meeting shall be held with the City prior to commencing staking. All construction staking shall be inspected by the City prior to construction.

The minimum staking of waterlines shall be as directed by the City Inspector or as follows:

A. Stake centerline alignment every 50 feet (25 feet through curve sections) with cuts and/or fills to invert of pipe maintaining 42 inches of cover over pipe.

B. Stake alignment of all fire hydrants, tees, water meters, setters and other fixtures and mark cut or fill to hydrant flange finished grade.

6.160 Trench Excavation

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

B. Trenches shall be excavated to the line and depth designated by the City to provide a minimum of 42 inches of cover over the pipe. Except for unusual circumstances where approved by the City, the trench sides shall be excavated vertically and the trench width shall be excavated only to such widths as are necessary for adequate working space as allowed by the governing agency. The trench shall be kept free from water until joining is complete. Surface water shall be diverted so as not to enter the trench. The owner shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out.

C. The contractor shall perform all excavation. Whatever obstructions are encountered shall be removed or cut out to the width of the trench or roadway section to a depth six inches below water main grade. Where materials are removed from below water main grade, the trench shall be backfilled to grade with material satisfactory to the City and thoroughly compacted.

D. Trenching and shoring operations shall be in conformance with Washington Industrial Safety and Health Administration (WISHA), Washington Department of Labor and Industries (L&I) and Office of Safety and Health Administration (OSHA) Safety Standard.

6.165 Thrust Blocking

Location of thrust blocking shall be shown on plans. Thrust block shall comply with the City thrust blocking details. The addition of restrained

joint fittings may not eliminate the need for thrust blocking.

6.170 Bedding and Backfilling

Bedding material per the City bedding detail shall be placed and compacted around and 4 inches under the water mains by hand tools and to a height of six inches above the top of the water main. The remaining fill shall be compacted to 95 percent of the maximum density. Where governmental agencies other than the City have jurisdiction over roadways, the fill and compaction shall be done to the satisfaction of the agency having jurisdiction. If suitable material, as determined by the City, is not available from trenching operations, the City may order the placing of imported fill conforming to WSDOT/APWA Standard Specification 9-03.12(3) around the water main and gravel base conforming to Section 9-03.10 of the WSDOT/APWA Standard Specifications for Road, Bridge, and Municipal Construction for backfilling the trench. Bedding and backfilling shall be required per the detail.

6.175 Street Patching and Restoration

See Section 4B.170, 4B.173, and 4B.175 and trench restoration detail for requirements regarding street patching and trench restoration.

6.190 Hydrostatic Tests

After the water main and appurtenances and service connections to the meter setter have been installed, filled, and sterilized, the system shall be tested in sections not to exceed 1,500 feet in length. The test shall be conducted under a hydrostatic pressure equal to 150 psi in excess of that under which it will operate. In no case shall the test pressure be less than 225 psi for 15 minutes. Any leaks or imperfections developing under said pressure shall be remedied by the contractor. All valves within the system shall be tested. Insofar as possible, no hydrostatic pressure shall be placed against the opposite side of the valve being tested. Test pressure shall be maintained while the entire installation is inspected.

The contractor shall provide all necessary equipment and shall perform all work connected with the tests. The test pump shall be clean and disinfected and shall only be used on potable water supplies. Tests shall 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 shall perform the test to assure that

the equipment to be used for the test is adequate and in good operating condition and the air in the line has been released before requesting the City to witness the test.

6.200 Sterilization and Flushing

A. Prior to the acceptance of the work, sterilization of water mains shall be accomplished by the contractor in accordance with the AWWA standard C651-05 for disinfecting water mains. Testing and sampling shall take place after all underground utilities are installed and compaction of the trench to sub-grade or finish grade is complete.

1. The city inspector will open the water valves to fill the new main at the request of the contractor. A minimum chlorine concentration of 50 mg/L shall be established throughout the line. After the main is filled, the valves shall be closed by the city inspector and the line left undisturbed for 24 hours. A minimum free chlorine residual of 10 mg/L shall remain following this period.

2. After the main has been filled, hydrostatic pressure testing shall be conducted by the contractor in the presence of the city inspector.

3. After the 24-hour contact time has passed, the contractor shall thoroughly flush the disinfected water main to the sewer or an approved receptacle under the supervision of the city inspector. Flushing will not be complete until chlorine levels in the new main are representative of residuals within the city main system. It will be the contractor's responsibility to measure chlorine residuals during flushing using a method that is accepted by the Washington State Department of Health for drinking water samples. At no time shall chlorinated water from a new main be flushed directly or indirectly into a body of fresh water. This is to included lakes, rivers, streams, drainage ways, and any and all other waters where fish or other natural aquatic life can be expected.

4. After the main has been thoroughly flushed, water samples shall be taken. Only the city inspector will close the water valves to ensure that the new section is isolated. The city inspector will request microbiological samples to be collected by city staff. For approval by

the local health agency, samples will be collected by the city no sooner than 24 hours after flushing is completed. The valves are to remain closed until microbiological samples for all the connection are satisfactory.

B. Subsequent action will be taken based on initial results of microbiological tests.

1. If coliform bacteria are absent in all new main samples, the city will open valves to the new and the existing system. At that time, the testing process for the new section of main shall be considered complete.

2. If coliform bacteria are present in one new main sample, but there is absence of fecal coliforms or E. coli., the contractor shall take action as directed by the city inspector, including re-flushing the water main. The city shall then re-sample the new main to ensure that the entire section was adequately sterilized as determined by the results of microbiological sample(s) collected following the process in A.3 above.

3. If coliform bacteria are present in more than 1 sample collected from the new section, or from a second sample collected under step B.2., of if fecal coliforms or E. coli were detected in any of the new main samples, the city shall ensure that a microbiological sample is collected from the existing water system "upstream" of the project. If the "upstream" sample(s) indicates that coliforms are present in the city water system, go to "C" below. If the "upstream" sample indicates an absence of coliforms in the city water system, the contractor shall re-disinfect the new mains with sodium hypochlorite solution using the continuous feed method as described in the AWWA Standard C651-05 for Disinfecting Water Mains, and then proceed with steps A.1., A.2 and A.3 above. To demonstrate that the new water main was adequately sterilized two sets of microbiological samples, collected at least 24 hours apart with no flushing in between, must indicate an absence of coliform bacteria in the new main.

C. If an "upstream" sample indicates the presence of coliform bacteria in the city water system, the city shall follow State Department of Health regulations and guidance for addressing the presence of coliforms in the distribution system. The city will calculate system compliance for coliform bacteria and take appropriate action per the City of Tumwater Coliform Monitoring Plan under the supervision of the City of Tumwater Water Resources Division. Follow-up actions may include, but are not limited to: identifying and correcting the likely source(s) of contamination, flushing, testing, and/or public notification. Disinfection and testing of the new main(s) shall not resume until the city water supplying the project test free of coliforms. At that time, the contractor shall take action as directed by the city inspector, including re-flushing the water main prior to the city requesting another set of microbiological samples.

If the initial treatment results in an unsatisfactory bacteriological test, the original chlorination procedure shall be repeated by the contractor until satisfactory results are obtained.

6.210 Irrigation

All irrigation systems located within the public right-of-way shall be designed by a State of Washington registered landscape architect or City approved firm. Parts lists shall be submitted with each project.

Prior to submitting the design, the contractor/engineer/landscape architect shall hire an independent Certified Landscape Irrigation Auditor, as certified by The Irrigation Association, to review and approve the proposed design.

After the irrigation system is installed, the contractor shall provide an irrigation audit to be performed on the new system by an independent Certified Landscape Irrigation Auditor (CLIA), as certified by the Irrigation Association, prior to final field observation by the Engineer. The CLIA shall test for proper coverage as determined by the Landscape Irrigation Auditor Handbook, most recent edition. The CLIA shall provide written certification that the irrigation system installed provides proper coverage as provided in the handbook.

The General Notes on the following pages are required on all plans for City operated or maintained irrigation systems or on any owner association operated or maintained irrigation systems located within the public right-of-way.

Irrigation systems shall be installed with an approved backflow prevention assembly in accordance with Chapter 6.110 of this manual.

A separate irrigation meter shall be provided for irrigation systems. Medians shall require a separate meter. The irrigation system shall be installed after the area has been properly prepared. See Chapter 4B.125 for soil preparation requirements. The pipe trenches shall be no wider than is necessary to lay the pipe or install equipment.

The median system shall be a completely separate system with its own separate appurtenances.

Irrigation sprinklers shall be situated so as to not wet any public street or sidewalk. Spray heads shall not be used in planters less than 3 feet wide. Drip irrigation methods shall be employed in areas less than 3 feet wide to prevent overspray. Turf heads shall be placed at finished grade as measured from the top of the sprinkler. Shrub heads shall be 12-inch pop up type placed at finished grade unless otherwise specified. Drip irrigation emitters shall be installed in accordance with the manufacturer's recommendations.

Installation and maintenance of irrigation systems in roadway planter strips installed by private development shall be as shown in the table below. The system maintainer shall be responsible for the on-going water and power expenses incurred.

	Single Family Residential Zones	**Multi-Family & All Other Zones**
Arterial Boulevard	Developer installs, Homeowners Association maintains	Developer installs, Owner or Owners Association maintains
Arterial	Developer installs, Homeowners Association maintains	Developer installs, Owner or Owners Association maintains
Collector	Developer installs, Homeowners Association maintains	Developer installs, Owners Association maintains
Residential	Developer installs, Homeowner Association maintains	Owner installs, Owner maintains

GENERAL NOTES (IRRIGATION SYSTEMS)

1. All workmanship, material and testing shall be in accordance with the City of Tumwater Development Guidelines, the National Electrical Code and the most current copy of the *WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction* unless otherwise specified below. In cases of conflict, the most stringent standard shall apply.

2. The contractor shall be in compliance with all safety standards and requirements as set forth by OSHA, WISHA and the Washington State Department of Labor and Industries.

3. The contractor shall be responsible for all traffic control in accordance with the *WSDOT/APWA Standard Plans for Road, Bridge and Municipal Construction* (all applicable "K" plans) and/or the *Manual on Uniform Traffic Control Devices* (MUTCD). Prior to disruption of any traffic, a traffic control plan shall be prepared and submitted to the City for approval. No work shall commence until all approved traffic control is in place.

4. All approvals and permits required by the City of Tumwater shall be obtained by the contractor prior to the start of construction.

5. If construction is to take place in the County right-of-way, the contractor shall notify the County and obtain all the required approvals and permits.

6. If deemed necessary, a pre-construction meeting shall be held with the City of Tumwater Construction Inspector prior to the start of construction.

7. The contractor shall be fully responsible for the location and protection of all existing utilities. The contractor shall verify all utility locations prior to construction by calling the Underground Locate line at 1-800-424-5555 a minimum of 48 hours prior to any excavation.

8. It shall be the responsibility of the contractor to have a copy of an approved set of the landscaping plans on the construction site at all times.

9. Temporary erosion control/water pollution measures shall be required in accordance with section 1-07.15 of the *WSDOT/APWA Standard Specifications for Road, Bridge and Municipal Construction* and the *Drainage Design and Erosion Control Manual for Tumwater*. At no time will silts and debris be allowed to drain into an existing or newly installed facility unless special provisions have been designed.

10. Electrical permits and inspections are required for all irrigation services within the City of Tumwater. The contractor is responsible for obtaining permits prior to any type of actual construction. Prior to installation of any materials, the irrigation contractor shall submit for approval by the City, five copies of material catalog cuts, specifications, shop drawings and/or wiring diagrams. Any materials purchased or labor performed prior to such approval shall be at the contractor's own risk.

11. A clearly marked service disconnect shall be provided for every automatic irrigation installation unless otherwise stated on a City approved set of plans. The location and installation of the disconnect shall conform to the National Electrical Code (NEC) and City of Tumwater standards. The service disconnect shall be City approved.

12. All low voltage wire shall be a minimum size of #14 UF from each control valve to the terminal interface.

13. All low voltage splices shall be of a type equal to a Spears DS 400 or a City approved equal. All splices shall be done in valve control boxes. Direct burial splicing will not be allowed

14. The automatic controller components shall be as specified in Section 6.210F of the Development Guidelines.

15. The City will be given 72 hours notice prior to scheduling a shutdown. Where connections require "field verification", connection points will be exposed by the contractor and the fittings verified 48 hours prior to distributing shut-down notices.

16. A materials specifications list similar to Section 6.210G shall be shown on the plans.

17. A separate irrigation meter shall be provided for irrigation systems. Medians shall require a separate meter. The irrigation system shall be installed after the area has been properly prepared. See Chapter 4B.125 for soil preparation requirements. The pipe trenches shall be no wider than is necessary to lay the pipe or install equipment. The top 6 inches of topsoil shall be kept separate from the subsoil and shall be replaced as the top layer when backfill is made.

18. The median system shall be a completely separate system with its own separate appurtenances on City owned medians.

19. All irrigation lines to be installed under existing pavement or areas to be paved, shall be installed within a minimum 4 inch diameter or twice the diameter of the encased pipe. The casing shall be steel casing (minimum schedule 40) or C900 Class 200 PVC pipe. The irrigation casing shall extend a minimum of 1 foot beyond the structure under which casing is being jacked or bored.

20. Upon final acceptance of the work, the contractor shall submit as-builts per Chapter 3.105.

21. Privately owned sprinkler heads built along slopes in excess of 2 percent shall contain check valves.

A. Layout of Irrigation System

The contractor shall stake all irrigation heads and mark all proposed trenches within the irrigation system per the approved plans prior to installing the system. Alterations in layout may be expected, i.e., to conform to ground conditions and to obtain full and adequate coverage to the landscaping. However, no alterations shall be made without prior authorization by the City.

B. Excavation

All soil shall be prepared as specified in 4B.125 prior to trenching. Trenches shall be no wider at any point than is necessary to lay pipe or install equipment. Trench bottoms shall be of relatively smooth sand 4 inches below and 6 inches above the pipe.

Detectable marking tape shall be placed in the trench 6 inches directly above, parallel to, and along the entire length of all nonmetallic water line and nonmetallic conduit. The width and depth of the tape shall be as recommended by the manufacturer or the City.

C. Piping

The irrigation main line is the line containing the supply usually situated between the irrigation meter and the irrigation control valves. The irrigation lateral lines are the lines between the irrigation control valves and the connections to the irrigation heads. Swing joints, thick walled poly pipe, flexible risers, rigid pipe risers, and associated fittings are not considered part of the lateral line but incidental components of the irrigation heads.

All water lines shall be a minimum of 18 inches below finished grade as measured from the top of the pipe. Where possible, mains and laterals or section piping shall be placed in the same trench.

All irrigation lines to be installed under existing pavement or areas to be paved, shall be installed within a minimum 4 inch diameter or twice the diameter of the encased pipe. The casing shall be steel casing (minimum schedule 40) or C900 Class 200 PVC pipe. The irrigation casing shall extend a minimum of 1 foot beyond the structure under which casing is being jacked or bored.

D. Valve boxes

Valve boxes shall be installed flush to grade outside of play and high vehicular and pedestrian traffic areas.

Valve boxes shall have filter fabric underlayment installed at the bottom to prevent rodent intrusion and sediment build-up.

Valve boxes shall be supported with bricks or concrete blocks as approved by the City to prevent settlement.

E. Pipe Connections

During construction, pipe ends shall be plugged or capped to prevent entry of dirt, rocks, or other debris.

PVC pipe, couplings and fittings shall be handled and installed with care and in accordance with the manufacturer's recommendation. For gasketed connections, the outside of the PVC pipe shall be chamfered to a minimum of 1/16 inch at approximately 22 degrees. For all other connections, pipe and fittings shall be joined by solvent welding. Solvents used must penetrate the surface of both pipe and fittings which will result in complete fusion at the joint. The solvent and cement shall be of a type recommended by the pipe manufacturer.

Threaded PVC joints shall be assembled using Teflon tape as recommended by the pipe manufacturer.

On plastic to metal connections, work the metal connection first. Use a non-hardening compound on threaded connections. Connections between metal and plastic are to be threaded utilizing female threaded PVC adapters with a threaded schedule 80 PVC nipple only.

F. Electrical Wire Installation

The electrical controller shall be located in an open space or in a utility easement whenever possible.

All control wires shall be labeled at the controller, splice boxes and at the valves in the field.

Wiring between the automatic controller and the automatic valves shall be direct burial, #14 and may share a common neutral. A minimum of two spare # 14 UF yellow wires shall be installed from the

controller to the furthest valve in each direction, looping through each control valve box. There shall be a 2 foot loop left in each control valve box. Separate control conductors shall be run from the automatic controller to each valve. When more than one automatic controller is required, a separate common neutral shall be provided for each controller and the automatic valve which it controls. Wire shall be installed adjacent to or beneath the irrigation pipe. Plastic tape or nylon ty-wraps shall be used to bundle wires together at 10-foot intervals, and the wire shall be "snaked" from side to side in the trench. When necessary to run wire separate from the irrigation pipe, the wire shall be bundled and placed under detectable marking tape. When lateral pipe lines have less than 18-inches of cover, direct burial wire shall be installed below the pipe at a minimum depth of 18 inches from finished grade.

Wiring placed under pavement and walls or through walls, shall be placed in irrigation casing. See 6.210 Section C.

Splices will be permitted only at junction boxes, valve boxes, or at control equipment. A minimum of 2 feet of excess conductor wire shall be left at all splices and terminal and control valves to facilitate inspection and future splicing.

G. Material Specifications

As a means of keeping the City's parts inventory to a minimum and maintenance personnel familiarized and knowledgeable about product operation, the following is a list of approved products to be used on all jobs in which the City will be responsible for maintenance and operations. Requests for approved equals need to be submitted to the City of Tumwater Development Services Department, Engineering Division with approval from Public Works.

Pop Up Spray Heads	Rainbird 1800 PRS SAM • minimum of 4" pop up • installed on Toro Funny Pipe
Gear Driven Rotary Heads	Hunter I-20 and I-40 Series • installed on prefabricated O-Ring PVC Swing Joints • check valves on all head
Remote Control Valve and Master Valve	Weathermatic 21000DW Series installed with isolation ball valve and double union. A master valve shall be installed directly after the DCVA
Quick Coupling Valves	West Ag 4V100-R-Y or Rainbird 44RC • Installed at point of connection and at the furthest valve at the far end of the main line • Installed on prefabricated O-Ring PVC Swing Joints
Double Check Backflow Preventer	Febco 850U or approved DOH equal with schedule 80 PVC unions

Flow Sensing Device	Data Industrial IR series • Installed with master control valve • Wiring between flow sensor and irrigation controller shall be twisted pair direct burial 2-conductor shielded 18 AWG or larger stranded copper wire with appropriate ratings for distance of run. Wire shall be a single run with no splices. • Master control valve shall be the same valve as the remote control valve
Automatic Controller (for City owned and Maintained systems)	Toro Sentinel with stainless steel cabinet ad full surge protection • Shall be grounded conforming to NEC specifications
Valve Boxes	• Carson 910-12B for Quick Coupler • Carson 1419B for remote control valve • Other boxes shall be sized accordingly
Shut-Off Valves	Wilkins 215 ball valve or approved equal

H. Flushing

All main supply lines shall receive two fully open flushing's to remove debris that may have entered the line during construction. The first flushing shall be completed prior to installing valves or testing.

All lateral lines shall receive one full-open flushing prior to placement

of sprinkler heads, emitters, and drain valves. Note, drain valves on main lines are not recommended. Quick couplers shall be installed on the downstream side at the cross connection device and at each terminus of the main line from the cross connection device. The flushing shall be of sufficient duration to remove any dirt and debris that have entered the lateral lines during construction.

I. Testing

All gauges used for testing water pressure shall be certified correct by an independent testing laboratory immediately prior to use on the project. Gauges shall be retested when ordered by the inspector.

Automatic controllers shall be tested by actual operation for a period of two weeks under normal operating conditions. Should adjustments be required, the Contractor shall do so according to the manufacturer's recommendation or under the City's direction until the operation is satisfactory to the City.

All main lines shall be purged of air and tested with a minimum static water pressure of 150 psi for 60 minutes without introduction of additional service or pumping pressure. Testing shall be done with one pressure gauge installed on the line in a location determined by the City inspector. Lines which show loss of pressure exceeding 5 psi after 60 minutes will be rejected.

All lateral lines shall be purged of air and tested in place at operating line pressure with a pressure gauge and with all fittings capped or plugged. The operating line pressure shall be maintained for 30 minutes with valves closed and without introduction of additional pressure. Lines which show leaks or loss of pressure exceeding 5 psi at the end of specified test period will be rejected.

The contractor shall correct rejected installations and retest for leaks as specified herein.

J. Backfill

Backfill shall not be started until all piping has been inspected, tested and approved by the City inspector, after which, backfilling shall be completed as soon as possible. All backfill material placed within 6-inches of the pipe shall be free of rocks, roots, or other objectionable material which might cut or otherwise damage the pipe. Backfill from the bottom of the trench to approximately 6-inches above the pipe shall

be by continuous compacting in a manner that will not damage pipe or wiring and shall proceed evenly on both sides of the pipe. The remainder of the backfill shall be thoroughly compacted, except that heavy equipment shall not be used within 18-inches of any pipe. The top 6-inches of the backfill shall be of topsoil material.

K. Adjusting System

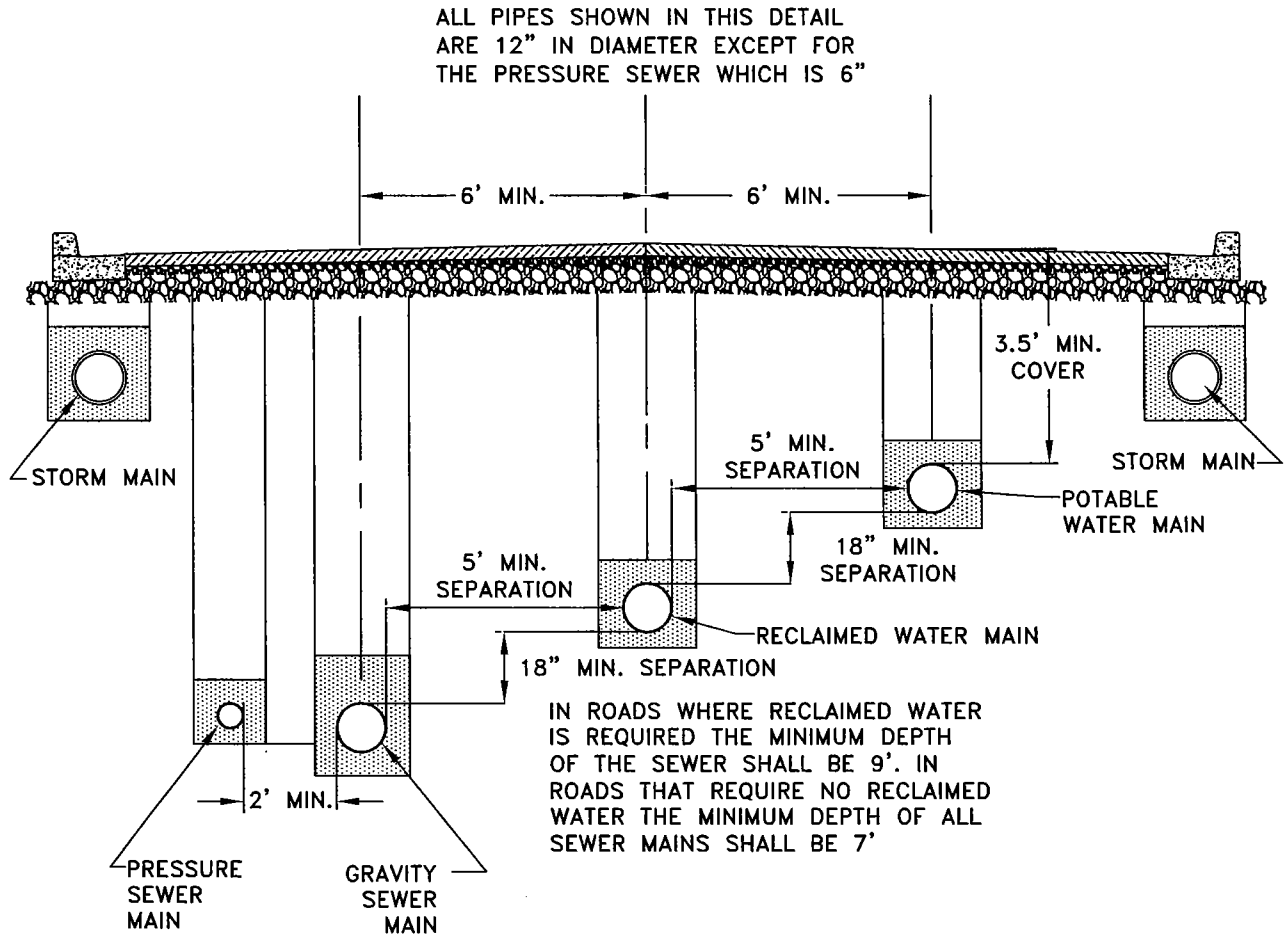
Before final inspection, the contractor shall adjust and balance all sprinklers to provide adequate and uniform coverage. Spray patterns shall be balanced by adjusting individual sprinkler heads with the adjustment screws or replacing nozzles to produce a uniform pattern.

L. System Operation

The irrigation system shall be completely installed, tested and operable prior to planting unless otherwise specified in the plans or as approved by the City. The contractor shall be responsible for all maintenance, repair, and testing, inspecting and automatic operation of the system until all work is considered complete as determined by the final inspection.

M. As-Built Plans

Upon final acceptance of the work, the contractor shall submit two as-builts per Chapter 3.105.



GENERAL NOTES:

1. THE POTABLE WATER MAIN SHALL BE INSTALLED ON THE NORTH AND EAST SIDE OF THE ROADWAY (6' OFF CENTERLINE).
2. THE SEWER MAIN SHALL BE INSTALLED ON THE SOUTH AND WEST SIDES OF THE ROADWAY (6' OFF CENTERLINE). WHEN THE INSTALLATION REQUIRES BOTH GRAVITY AND PRESSURE SEWER MAINS THE PRESSURE MAIN SHALL BE INSTALLED FURTHER SOUTH OR WEST OF THE GRAVITY SEWER MAIN.
3. THE RECLAIMED WATER MAIN SHALL BE INSTALLED IN THE CENTER OR TO THE SOUTH OR WEST THE CENTER LINE OF THE ROADWAY OR AS DIRECTED BY THE CITY.
4. ALL OF THE ABOVE PIPING SHALL BE INSTALLED IN ORDER OF DESCENDING QUALITY WITH A MINIMUM OF 18" SEPARATION FROM THE BOTTOM OF THE HIGHER PIPE TO THE CROWN OF THE LOWER PIPE. NO DEVIATIONS FROM THIS REQUIREMENT SHALL BE ALLOWED.
5. THE HORIZONTAL SEPARATION WHEN ATTAINABLE SHALL BE 10' FROM THE SPRING LINE OF ONE PIPE TO THE SPRING LINE OF THE NEXT PIPE. WHEN THE 10' SEPARATION IS NOT ATTAINABLE, APPROVAL FROM THE CITY IS REQUIRED TO REDUCE THE SEPARATION REQUIREMENTS TO 5' HORIZONTAL AND 18" VERTICAL.
6. THE DESIGN REQUIREMENT ON THIS SHEET SHALL APPLY TO ALL SITUATIONS WITHIN THE RIGHT-OF-WAY OR EASEMENTS, EXISTING OR PROPOSED.

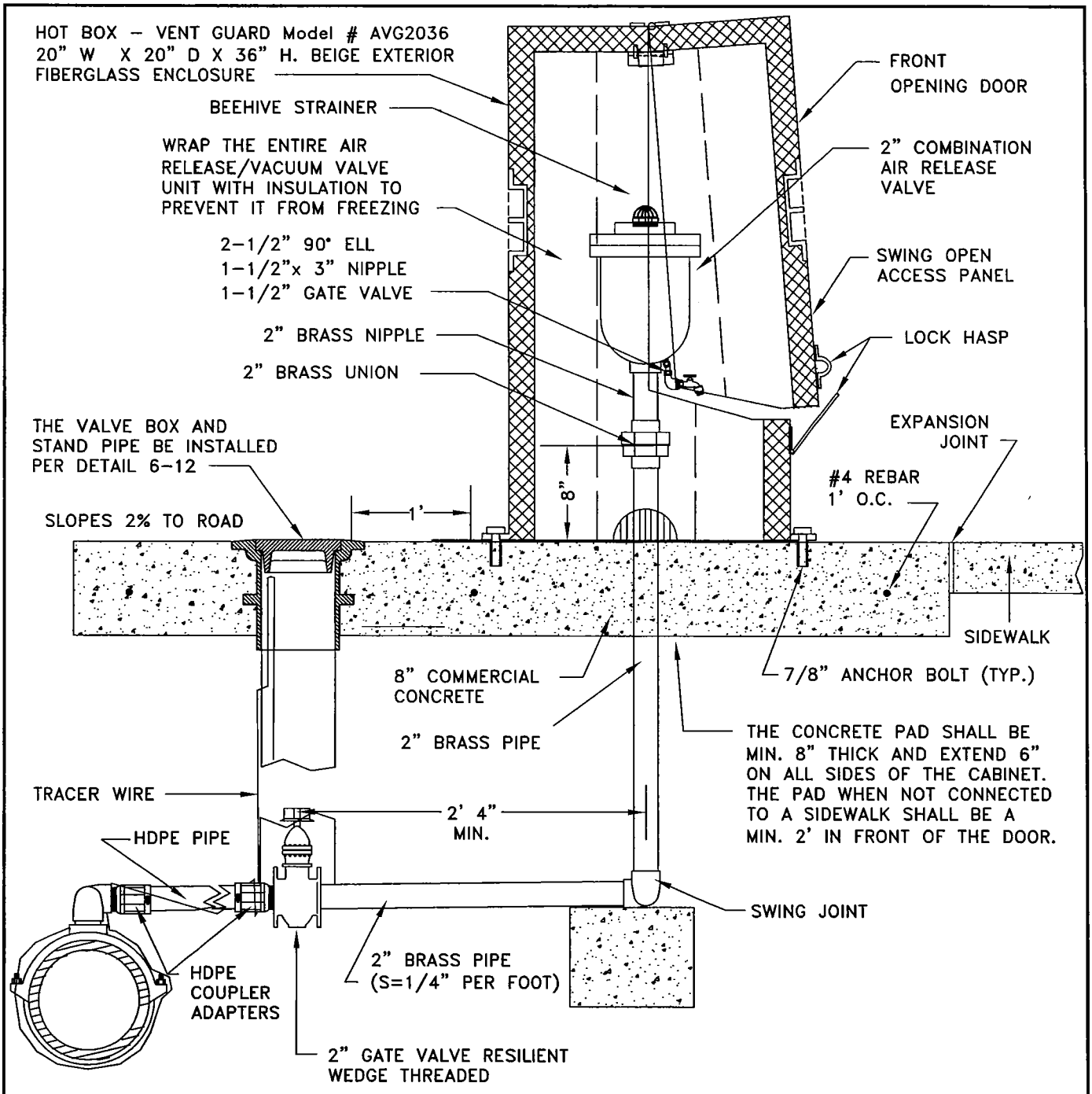
CITY OF TUMWATER, WASHINGTON
DEPT. OF PUBLIC WORKS

WATER, RECLAIMED WATER, GRAVITY & PRESSURE SEWER PIPE ZONES IN ORDER OF DESCENDING QUALITY

APPROVED	DWG. NO.
CITY ENGINEER	7-22

DES	DWN	CKD	DATE
PW	PW	JCE	AUG. 09

DG7-22.DWG



GENERAL NOTES:

1. VALVE ASSEMBLY SHALL BE SET AT THE HIGH POINT OF THE LINE.
2. ALL AIR/VACUUM RELEASE VALVES SHALL BE INSTALLED BEHIND THE SIDEWALK AT THE NEAREST PROPERTY CORNER AND NOT IN FRONT OF A RESIDENCE.
3. AIR RELEASE VALVES SHALL BE 2" APCO 145C, VAL MATIC 202C OR CRISPIN UL–20, ARI D–040 W/THERMO PROTECTION ENCASEMENT.
4. ALL FITTINGS AND PIPING SHALL BE BRASS.
5. CABINET SHALL OPEN TOWARDS SIDEWALK.
6. WRAP THE AIR/VACUUM RELEASE VALVE UNIT AND PIPING W/INSULATION TO PREVENT IT FROM FREEZING.

DG6–9.DWG

CITY OF TUMWATER, WASHINGTON
DEPT. OF PUBLIC WORKS

2" AIR AND VACUUM RELEASE VALVE

APPROVED	DWG. NO.
CITY ENGINEER	6–9

DES.	DWN.	CKD.	DATE
PW	PW	JCE	AUG. 09