

Appendix G Chapter 5 - Policies and Design Criteria
City of Stanwood Comprehensive Water System Plan

Policies and Design Criteria

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INTRODUCTION

The City of Stanwood (City) operates and plans water service for City residents according to the design criteria, laws, and policies that originate from the following seven sources, listed in **Table 5-1** descending order from those with the broadest to narrowest authority.

Table 5-1
Regulatory Agencies

Agency	Design Criteria/Laws/Policies
U.S. Department of Health & Human Services	Federal Regulations
U.S. Environmental Protection Agency	Federal Regulations
Washington State Department of Health	State Regulations
Washington State Department of Ecology	State Regulations
Snohomish County Council	County Regulations
Stanwood City Council	Administrative Policies
American Water Works Association	Design Criteria

These laws, design criteria, and policies guide the City's operation and maintenance of the water system on a daily basis, and its planning for growth and improvements. Their overall objective is to ensure that the City provides high-quality water service at a minimum cost to its customers. They also set the standards the City must meet to ensure that its water supply is adequate to meet existing and future water demands. The system's ability to meet these demands is detailed in **Chapter 7**, and the recommended improvements are identified in **Chapter 9**.

The highest three governmental entities establishing policies and laws – the U.S. Government, Washington State, and Snohomish County Council – establish requirements in statutes, regulations or ordinances. The Stanwood City Council and Mayor adopt policies that cannot be less stringent or in conflict with those established by governments above them. The City's policies take the form of ordinances, memoranda and operation procedures, many of which are summarized in this chapter.

The policies associated with the following categories are presented in this chapter:

- Supply;
- Customer Service;
- Facilities;
- Finance; and

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- Organization.

SUPPLY POLICIES

Quality Protection

- The City will pursue steps to meet or exceed all water quality laws and standards.
- The City will take all reasonable measures to protect its system and customers.

Cross-Connection Control

- The City has a responsibility to protect the public water system from contamination due to cross-connections. Cross-connections that can be eliminated will be eliminated.
- The City has a cross-connection control program for eliminating cross-connections. A copy of the City's Cross-Connection Control Plan is contained in [Appendix G](#).
- The City has staff that is certified for backflow prevention and testing.
- The City will comply with the backflow prevention assembly installation and testing requirements as indicated in the Washington Administrative Code (WAC) 246-290-490, and as published in the *Cross Connection Control Manual Accepted Procedure and Practice*, Pacific Northwest Section – American Water Works Association (AWWA).

Quantity

- The City will plan for saturation use of its supply sources so that future water resource limitations can be handled effectively.
- The City will ensure that the capacity of the system, including wells, pump stations and transmission mains, is sufficient to meet the peak day demand of the system.

Fire Flow

- The City will plan to provide the following minimum fire flows.

Low Density Residential:	1,000 gallons per minute (gpm) for 2 hours duration
Medium Density Residential:	1,750 gpm for 2 hours duration
High Density Residential:	2,500 gpm for 2 hours duration
Traditional Neighborhood:	2,500 gpm to 3,000 gpm for 2 to 3 hours duration
Commercial/Business Park:	3,000 gpm for 3 hours duration

Light Industrial:	3,500 gpm for 3 hours duration
Schools:	3,500 gpm for 3 hours duration

Water Use Efficiency

- The City will promote the efficient and responsible use of water and will conserve water during a water shortage.

Regional Participation

- The City will participate in regional supply management and planning activities.
- The City will supply all customers within the City’s water service area, unless a special agreement with an adjacent purveyor exists due to topography or other limiting factors.

CUSTOMER SERVICE POLICIES

Duty to Serve

The City has a duty to provide service to all new connections within the retail service area when the circumstances meet the following four threshold factors:

- The City has sufficient capacity to serve water in a safe and reliable manner.
- The service request is consistent with local plans and development regulations.
- The City has sufficient water rights to provide service.
- The City can provide service in a timely and reasonable manner.

The following section, Water Service and Connection, provides additional details regarding the City’s duty to serve policies.

Water Service and Connection

- The City will strive to provide potable water service to all people within the City limits and designated retail water service area (i.e., where there are existing water mains), provided all policies related to service can be met. Requests for new water service outside the City limits but within the UGA where there are no existing water mains fronting the property will only be granted a upon extension of water service and completion of an annexation agreement.
- All proposed developments within the City limits and designated water service area shall connect directly to the City’s water system, unless deemed unfeasible by the City at the time of the request.
- Water system extensions required to provide water service to proposed developments shall be approved by the City’s Department of Public Works and must conform to the City’s adopted

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design criteria and construction standards and specifications, as shown in the City's Water System Standards contained in [Appendix H](#). All costs of the extension shall be borne by the developer.

- Water service cannot be extended outside of the water service area.
- For water service applications within the City limits, the City will review the availability for water service at the time of land use permit, site civil review and building permit. During the land use permitting process, the City will determine if water is available for the site. During the site civil review, the City will address the sizing and looping of the water main. The formal water service application begins at the time of building permitting when fire flow and service sizing is evaluated. The complete process takes several months to be completed.
- For water service applications outside of the City limits, the applicant must first obtain a water utility service agreement from the City. The City will review the agreement and determine the availability of water. Water availability requests will be processed within two weeks.
- Water system capacity will be evaluated at the time of water service application. The City will use the capacity analysis contained in [Chapter 7](#) of this Comprehensive Water System Plan (WSP) to evaluate source of supply, storage and water rights capacity available to the applicant.
- Water system capacity, pressure and fire flow will be considered when providing water availability to applicants.
- Water availability shall expire at the time that the associated permit expires (i.e., land use, site civil, or building permit).
- Time extensions in regard to water availability shall be granted in accordance with the associated permit requirements. When extensions are denied, the disputes are handled through the rules guiding the associated permit process. Disputes can be brought to the City Council for discussion.
- Individual wells may be installed on existing platted lots within the City's service area if the City determines it is unfeasible to provide direct connection to the City's water system at the time of the request. Owners of individual wells will be required to connect to the City's water system at the time City water becomes available.

Annexations

- Areas annexed without existing municipal supply will be served by the City.
- Areas annexed with existing municipal supply must meet City water standards.
- The City will follow state guidelines in the assumption of facilities in annexation areas.

Temporary Services

- No temporary service is allowed, unless there are plans for permanent water service that meets all City standards.

Emergency Service

- Compliance with standards may be temporarily deferred for emergency water service.
- Policy criteria may be waived for emergency service.

Planning Boundaries

- For planning purposes, the City will use water service boundaries established by agreement as a result of the *North Snohomish County Coordinated Water System Plan*.
- The City will follow State of Washington guidelines in assuming portions of adjacent water systems as a result of annexation.

Satellite System Management

- The City will consider providing satellite system management or ownership services within and adjacent to the City's existing service area.

FACILITY POLICIES

This section describes the planning criteria and policies used to establish an acceptable hydraulic behavior level and a standard of quality for the water system. Additional criteria are contained in the City's Water System Standards, a copy of which is included in [Appendix H](#).

Minimum Standards

- All proposed developments within the City's existing and future service areas shall conform to the City's adopted design criteria, construction standards, and specifications.

Pressure

- The City will endeavor to maintain a minimum pressure of 40 pounds per square inch (psi) at customer meters during normal demand conditions, excluding a fire or emergency.
- The City will endeavor to maintain a maximum pressure of 120 psi in the water mains during normal demand conditions, excluding pressure surges. Individual residences are responsible for reducing pressures over 80 psi.

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- The City will endeavor to maintain a minimum pressure of 30 psi at customer meters during all demand conditions, excluding a fire or emergency.
- During fire conditions, the minimum pressure at customer meters and throughout the remainder of the system is 20 psi.
- During a failure of any part of the system, the maximum pressure will not exceed 150 psi.

Velocities

- During normal demand conditions, the velocity of water in a water main should be less than 5 feet per second (fps).
- During emergency conditions such as a fire, and for design purposes, the velocity of water in a water main may exceed 5 fps, but may not exceed 8 fps.

Storage

- Storage within the distribution system must be of sufficient capacity to supplement supply when system demands are greater than the supply capacity (equalizing storage), and still maintain sufficient storage for proper pump operation (operational storage), fire suppression (fire flow storage) and other emergency conditions (standby storage).
- Equalizing storage must be provided when source pumping capacity cannot meet peak hour demands. Equalizing storage must be available at 30 psi to all service connections.
- Standby storage must be located above the elevation that yields a 20 psi service pressure to all services in the zone under peak hour demand conditions with the largest source out of service.
- The City will provide sufficient standby storage for an emergency condition in which a major supply source is out of service. The volume of storage will be sufficient to maintain uninterrupted supply to the system during the emergency condition. Standby storage will not be less than 200 gallons per equivalent residential unit (ERU).
- Fire suppression storage must be located above the elevation that yields a 20 psi service pressure to all services in the zone under peak day demand conditions.
- The City will provide sufficient fire suppression storage for a fire condition equal to the system's maximum fire protection water demand and the required duration.
- The City will have high-water level and low-water level alarms at the Operations and Maintenance office.
- A water level indicator will be located at the Operations and Maintenance office.

- Storage facilities will be located in areas where they will satisfy the following requirements:
 1. Minimize fluctuations in system pressure during normal demands;
 2. Maximize use of storage facilities during fires and peak demands; and
 3. Improve the reliability of supply to the City.

Transmission and Distribution

- Where practical, transmission and distribution mains will be looped to increase reliability and fire flow capacity and decrease head losses.
- All mains will comply with the generally recognized design criteria from the AWWA and the Washington State Department of Health guidelines that follow.
 1. All new construction will be in accordance with the City of Stanwood Water System Standards, a copy of which is included in [Appendix H](#) of this WSP.
 2. Distribution system design assumes that adequately-sized service lines will be used. All residential service lines will be 1-inch or larger. Service lines will be the same size as the meter or larger.
 3. The minimum diameter of distribution mains will be 8 inches. Water mains not required to carry fire flow, as determined by the City, may be 6 inches in diameter. All water mains will be ductile iron pipe.
 4. All new distribution mains will be sized by hydraulic analysis.
 5. All new mains providing fire flow will be sized to provide the required fire flow at a minimum residual pressure of 20 psi and maximum pipeline velocity of 8 fps during peak day demand conditions. In general, new water mains that will carry fire flow in residential areas shall be a minimum of 8 inches in diameter and looped for multi-family residential developments. New water mains in commercial, business park, industrial and school areas shall be a minimum of 12 inches in diameter and looped.
 6. Valve installations will satisfy the following criteria.
 - a. Zone valves will be located at all pressure zone boundaries to allow future pressure zone realignment without the need for additional pipe construction.
 - b. Isolation valves will be installed in the lines to allow individual pipelines to be shut down for repair or installing services. Unless it is impractical to do so, the distance between isolation valves will not exceed 1,000 feet. A minimum of three valves will be provided per

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cross and two valves per tee.

- c. Air/vacuum release valves will be placed at all high points, or “crowns,” in all pipelines.
 - d. Blowoff assemblies shall be located at main dead ends where there is not a fire hydrant. If a water main extension is expected in the future, the blowoff assembly shall have a valve the same size as the main with concrete thrust blocking.
7. Individual pressure reducing or check valves must be installed in all new customer service lines in the City. Pressure reducing valves protect customers from high pressures in case a mainline pressure reducing station fails. Check valves prevent hot water tanks from emptying into the City’s distribution system when a nearby water main is empty or when the pressure in the main is less than the pressure in the tank. Check valves also prevent contamination of the system’s mains caused by possible cross-connections in the customer's pipes or fixtures.
 8. Fire hydrant installations will satisfy the following criteria.
 - a. Fire hydrants serving detached single-family or duplex dwellings on individual lots will be located not more than 600 feet on center, such that all single-family lots are within 300 feet from a fire hydrant, as measured along the path of vehicular access.
 - b. Fire hydrants serving any use other than detached single-family or duplex dwellings on individual lots will be located not more than 300 feet on center, and will be located so that at least one hydrant is located within 150 feet of all structures, but not closer than 50 feet, unless approved by the Stanwood Fire Department.
 - c. Hydrants located in dead-end areas or cul-de-sacs shall service an area of no more than 120,000 square feet.
 - d. One fire hydrant shall be installed per intersection.
 - e. The Stanwood Fire Department will review all proposed fire hydrant installations to ensure the correct number and spacing of fire hydrants for each project.

Supply and Booster Pump Stations

- All existing and future booster pump stations will be modified/constructed to comply with the following minimum standards.
 1. All structures will be non-combustible, where practical.
 2. All buildings will have adequate heating, cooling, ventilation, insulation, lighting, and work spaces necessary for on-site operation and repair.
 3. Sites will be fenced to reduce vandalism and City liability, where appropriate.

4. Each station will be equipped with a flow meter and all necessary instrumentation to assist personnel in operating and troubleshooting the facility.
 5. Emergency power capability will be provided to at least one booster pump station supplying each pressure zone.
- Pumps will be operated automatically, with flexibility in pump start/stop settings.
 - Stations will be operated with the provision for at least two methods of control, to minimize system vulnerability.
 - Manual override of stations will be provided for and located at the Operations and Maintenance office using the City's telemetry and supervisory control system.
 - Stations will be monitored with alarms for the following conditions.
 1. Pump started automatically or manually
 2. Power phase failure
 3. Communication failure
 4. Water in structure
 5. Low suction pressure
 6. High discharge pressure
 - Stations will have the following indicators.
 1. Local flow indication and totalizing.
 2. Flow indication and totalizing at the Operations and Maintenance office.
 3. Recording of combined supply flow to the system.
 - Booster pump stations will be placed wherever necessary to fulfill the following criteria.
 1. Provide supply redundancy to a pressure zone.
 2. Improve the hydraulic characteristics of a pressure zone.
 3. Maximize storage availability and transmission capacity.
 4. Improve water quality (i.e., increase circulation) and quantity.

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Pressure Reducing Stations

- All pressure reducing valves will be placed in vaults that are large enough to provide ample workspace for field inspection and valve repair.
- Vaults will drain to daylight or will be equipped with sump pumps to prevent vault flooding.
- Pressure relief valves will be provided on the low pressure side of the pressure reducing valves to prevent system overpressurizing in case of a pressure reducing valve failure.

Control

- The City's control system must be capable of efficiently operating the water system's components in accordance with this WSP, and in response to reservoir levels, system pressures, abnormal system conditions, electrical power rate structure, and water costs.

Maintenance

- Facility and equipment breakdown is given the highest maintenance priority. Emergency repairs will be made even if overtime labor is involved.
- Equipment will be scheduled for replacement when it becomes obsolete and as funding is available.
- Worn parts will be repaired, replaced or rebuilt before they represent a high failure probability.
- Spare parts will be stocked for all equipment items whose failure will impact the ability to meet other policy standards.
- Equipment that is out of service will be returned to service as soon as possible.
- A preventive maintenance schedule will be established for all facilities, equipment and processes.
- Tools will be obtained and maintained to repair all items whose failure will impact the ability to meet other policy standards.
- Dry, heated shop space will be available for maintenance personnel to maintain facilities.
- All maintenance personnel will be trained to efficiently perform their job descriptions.
- Maintenance will be performed by the water maintenance staff and supervised by the Field Supervisor.
- Written records and reports showing operation and maintenance history will be maintained on each facility and item of equipment.

Reliability

- Supply to the service area will be pursued to meet peak day demand during a reasonable worst case supply system failure.
- System planning will determine whether connections with nearby systems will be reliable or available for use at saturation development or emergency situations.
- System demand planning will use historical demand data and assume all available land will be developed at saturation.

Vulnerability

- Supply vulnerability analyses will determine a reasonable worst case failure for the water system. The analyses will consider the following conditions.
 1. Failure of the single largest source of supply.
 2. Reservoir out of service.
- Storage vulnerability analyses will determine a worst case failure scenario for the water system. The analyses will consider:
 1. Peak day demand with simultaneous fire; and
 2. Peak hour demand with the largest source of supply out of service.

Joint Use

- All joint use facilities (with other public water systems) must comply with City of Stanwood policies and design standards.
- All joint use facilities will be maintained by the Water Department.
- Joint use facilities will be pursued only in those areas that improve reliability or reduce operating costs.

FINANCIAL POLICIES

General

- The City will set rates that comply with standards established by the AWWA.
- Rates and additional charges established for the City should be:

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1. Cost-based rates that recover current, historical and future costs associated with the City's water system and services;
 2. Equitable charges to recover costs from customers, commensurate with the benefits they receive; and
 3. Adequate and stable source of funds to cover the current and future cash needs of the City.
- The existing City customers will pay the direct and indirect costs of operating and maintaining the facilities through user rates. In addition, the user rates will include debt service incurred to finance the capital assets of the City.
 - New customers seeking to connect to the water system will be required to pay a connection charge for an equitable share of the historical cost of the system and for the system's capital improvement program (CIP). Connection charge revenues will be used to fund the CIP in conjunction with rate revenue.
 - New and existing customers will be charged for extra services through separate ancillary charges based on the costs to provide the services. Ancillary charges can increase equitability, as well as operating efficiency by discouraging unnecessary demand for services. The charges should be reviewed regularly and updated annually based on increases in the Consumer Price Index. Revenue from ancillary charges will be used to finance annual operations and maintenance.
 - The City will maintain information systems that provide sufficient financial and statistical information to ensure conformance with rate setting policies and objectives.
 - User charges must be sufficient to provide cash for the expenses of operating and maintaining the system. To ensure the fiscal and physical integrity of the utility, an amount should be set aside each year and retained for capital expenditures that will cover some portion of the depreciation of the physical plant. The amount may be transferred from the Maintenance Fund to the Construction Fund for general or specific purposes.
 - A Working Capital Reserve will be maintained to cover unanticipated emergencies and fluctuations in cash flow.
 - Water rates will be based on either the Base-Extra Capacity Method or the Commodity-Demand Method. Both methods strive to equitably charge customers with different service requirements based on the cost of providing water service. Service requirements relate to the total volume of water used, peak rates of use and other factors.
 - Fees and charges are calculated for the service area as a whole. Rates will be the same regardless of the existing customers' service locations. Rates charged in annexed areas will be evaluated on an individual basis.

Connection Charges

- Owners of properties that have not been assessed, charged, or borne an equitable share of the cost of the water system will pay one or more of the following connection charges prior to connection to a water main.

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1. *Latecomers Fees:* Latecomers fees are negotiated with developers and property owners; they provide for the reimbursement of a pro rata portion of the original cost of the water system extensions and facilities.
2. *Connection Charge:* The connection charge will be assessed against any property that has not participated in the development of the water system. Meter charges, or hookup fees, are additional to recover the cost of meter and service line installation.
3. *Developer Extension Charges:* These charges are for the administration, review and inspection of a developer extension project.

ORGANIZATIONAL POLICIES

Staffing

- Personnel certification will comply with state standards.
- The Water Department will promote staff training.

Relationship with Other Departments

- The Finance Department is responsible for customer billing, payment collection, project cost accounting and fund activity reporting.
- The Personnel Department is responsible for employee records, union labor negotiations, and salary schedules.
- The Fire Department uses water utility facilities for fire protection and establishes fire flow requirements.
- The Fire Department is responsible for emergency responses to hazardous events at water system facilities.
- The Police Department is responsible for enforcing violations of City water ordinances.
- The Fire Department is responsible for hydrant fire flow testing.
- The Fire and Water Departments are jointly responsible for fire hydrant testing.

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